A TREATISE ON THE YELLOW FEVER,

AS IT APPEARED IN THE

ISLAND OF *DOMINICA*,

IN THE YEARS 1793-4-5-6:

TO WHICH ARE ADDED,

OBSERVATIONS

ON THE

BILIOUS REMITTENT FEVER,

ON

INTERMITTENTS, DYSENTERY,

AND SOME OTHER WEST INDIA DISEASES;

ALSO,

The CHEMICAL ANALYSIS and MEDICAL PROPERTIES

OF THE

HOT MINERAL WATERS

IN THE SAME ISLAND.

BY

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PRINCIPIIS OBSTA.

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by the Author.—

DEDICATION

TO

MAXWELL GARTHSHORE,

M. D. F. R. S. AND S. A.

AND

Member of the College of Phyſicians of London, and F. R. S. and College of Phyſicians of Edinburgh, &c. &c.

SIR,

YOUR long and ſteady Labours for the Advancement of the Practice of Phyſic in general, and the great Attention you have ſhewn to Perſons employing their Time for the Improvement of Medicine in tropical Climates, encourage me to addreſs to you the following Treatiſe on the Yellow Fever, and

ſome other Diſeaſes of the Weſt Indies; and at the ſame Time I embrace the Opportunity of acknowledging, in a public Manner, the Obligations I owe to you for your Politeneſs and Friendſhip to me on all Occaſions.

I have the Honour to be, with great Eſteem,

SIR,

Your much obliged
and very humble Servant,

JAMES CLARK.

LONDON,
30th December 1796.

PREFACE.

THE following Obſervations on the Yellow Fever, which broke out in the Weſt Indies in the Year 1793, are ſolely founded on the experience I have been able to gain, during an extenſive practice in the iſland of Dominica.

With a view to avoid relating any thing which is not derived from my own experience and judgment, I have been cautious not to peruſe any of the publications which have appeared on the ſame ſubject: and I feel a ſatisfaction in affirming, that the care and attention I beſtowed on this diſeaſe for three years, whilſt it raged with the moſt dreadful violence in all the Weſt India iſlands, have not been beſtowed in vain; the Method of Cure and Prevention here recommended, having been attended with very great ſucceſs during the above period.

The obſervations on the Bilious Remittent Fever, on Intermittents, Typhus Fe-

ver, Dyſentery, Dry Belly-ach, Cholera Morbus, and the Tetanus, which follow in this Work, are the reſult of twenty-five years conſtant practice in the Weſt Indies; I therefore flatter myſelf that they will prove uſeful to young and unexperienced practitioners in that quarter.

I entertain the higheſt opinion of the merit and utility of the works of many of the medical gentlemen, who have publiſhed on theſe diſeaſes; but as in the former caſe, I have avoided quoting or taking notice of their practice, from the ſame deſire to publiſh only what has occurred to myſelf in the hiſtory and treatment of them, during ſo long a reſidence in that climate.

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CHAPTER I.

SECTION I.

History of the YELLOW FEVER, *in the Island of Dominica.*

BY the prodigious influx of emigrants from the island of Martinique to the town of Roseau in this island, about the 10th June 1793, the streets and houses were very much crowded. The number of people that arrived here in the course of three days, to avoid the cruelty and persecution of their countrymen, could not be ascertained exactly, but it was estimated at between three and four thousand. These people were brought over in small vessels, exposed to the weather, and in want of almost every necessary of life. They were not sick on their arrival; and this fever had not made its appearance in Martinique when they left it, as many of the most respectable amongst them declared to me.

In a few days after their arrival, viz. the 15th June, this Fever firſt broke out; and the firſt victim to it was an Engliſh ſeafaring man, aged about forty, who had only been a fortnight on the iſland, and had never before been in the Weſt Indies. Some days after, many of the ſailors on board the ſhips in the Road were attacked; and then the unfortunate emigrants were the next ſufferers. From the 1ſt July to the 1ſt October it was computed that eight hundred emigrants, including their ſervants and ſlaves, were cut off by this fever; and about two hundred Engliſh, including new-comers, ſailors, ſoldiers, and negroes, alſo fell victims to it, in the ſame ſpace of time. Few new-comers eſcaped an attack, and very few of theſe recovered. It ſpared neither age nor ſex among the Europeans and emigrants who arrived; and not only the people of colour from the other iſlands, but the new negroes who had been lately imported from the coaſt of Africa, were all attacked with it. I knew a lot of twenty-four fine healthy new negroes all ſeized with this fever about the ſame time,

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one third of whom died in the courſe of the diſeaſe. The negroes who had been long in the town, or on the iſland, eſcaped; I only recollect one exception, which was in a negro who had undergone very great fatigue, and had been much expoſed to the heat of the ſun during a long journey.

Many emigrants fled from this iſland; but, alas! it was to fall a ſacrifice to the ſame diſeaſe that now prevailed in every iſland. It appeared a few weeks earlier in Grenada and St. Vincent than it did in this, as we heard afterwards; and to the former it was ſuppoſed to have been brought by a Guinea ſhip with negroes from the iſland of Bullam, on the coaſt of Africa, and was therefore called the Bullam Fever. It was a few weeks later before it reached Antigua, and the reſt of the Leeward Iſlands; but all partook of its ravages during the autumnal months, and even till the month of December and January following.

During theſe months it alſo raged in Philadelphia; where, in the ſpace of three months

only, four thouſand citizens were cut off by it. It broke out about the ſame time at Jamaica and St. Domingo; from the latter of which iſlands the contagion was ſuppoſed to have been brought to the town of Philadelphia.

This Fever became leſs violent here in the month of October; and about the beginning of November it ceaſed altogether, which was ſuppoſed to proceed from the comparative coolneſs of the weather; but the arrival of ſome American veſſels, about ſix weeks after, convinced us that this ſhort reſpite was more owing to the want of proper ſubjects for the vitiated atmoſphere to act upon, than to the change of its temperature; for in a ſhort time all on board, who had not been in the Weſt Indies before, were ſeized with it, and although the mortality amongſt them was not ſo great as it had been, yet many died. This happened in December 1793, and January and February 1794. From this time till the month of July few caſes occurred, and moſt of theſe recovered; and even in the following autumnal months the mortality

tality was not near ſo great as in the former year.

After the 10th October 1794, when Berville camp in Guadaloupe ſurrendered, the emigration from that iſland commenced, and in a few weeks the town of Roſeau was nearly as much crowded as it had been in June 1793. This fever did not appear among theſe people until the 10th of November, and although many of them died, it was by no means ſo fatal as before, nor did it laſt more than two months.

From the middle of January till July 1795 it diſappeared; and even during this autumn only a few ſailors, from irregularity of living, were attacked, and two caſes only occurred in November: ſince which time to the 12th of June 1796, when I left the iſland, not a ſingle caſe of this diſeaſe had occurred. The autumnal ſeaſon, however, was then to be dreaded.

I find from my correſpondents, that this fever has followed nearly the ſame courſe in all the leeward iſlands; only that it has been

rather more violent, and continued longer, in this, owing perhaps to the town being so much crowded by the frequent emigration of the French from the islands that were situated near to us.

Section II.

The Symptoms.

This Fever sometimes begins with a slight rigor or chilly fit, rarely with shivering, succeeded by a violent head-ach and vomiting; but more frequently it comes on with lassitude, inclination to vomit, uneasiness at the pit of the stomach, and a severe pain in the back and forehead. The first attack is generally in the night, or towards morning; and very soon after, the eyes appear much inflamed, the face remarkably flushed, and an uncommon redness about the neck and breast succeeds. They cannot bear the light; but turn their faces from it, or cover their heads, and avoid it by every means.

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The fever comes on generally without any previous indiſpoſition, ſeizing the patient in a very ſudden manner; but ſome complained of laſſitude and head-ach the day before. The pulſe ſeldom beats more than 90 in a minute; and the heat was never ſo great as it is in the hot fit of an intermittent. The ſick had not much deſire for drink, and the tongue was not foul or white. What was vomited up during the firſt twelve hours, was only the contents of the ſtomach before, or what had been drank after the firſt attack. Bile was ſeldom diſcharged till eighteen or twenty-four hours after the firſt ſeizure; but about that time or ſoon after, it became of a deep yellow colour, then green, and gradually darker, till at laſt the black vomit made its appearance; which happened in a few caſes as early as in thirty-ſix hours, moſt commonly in forty-eight, in ſome not till the third or fourth day, and even as late as the fifth or ſixth, although this occurred rarely.

The head-ach was of a peculiar kind, being intirely confined to the lower part of the forehead, the eye balls and their ſockets. There was a remarkable inflammation in the tunica adnata, and fluſhing of the cheeks. An hœmorrhage from the noſe during the firſt twelve or eighteen hours ſeemed to relieve the head-ach, and ſome recovered after this ſymptom appeared; but if it did not come on before forty-eight or ſeventy-two hours, the diſeaſe proved fatal. Strong athletic people had generally ſome degree of delirium during the febrile ſtage, and ſome became quite outrageous. Women and delicate people were much dejected, and had a melancholic ſort of delirium; but all were prepoſſeſſed with an idea of dying from the commencement of the diſeaſe. Their moſt uniform and conſtant complaint was want of ſleep; they never even dozed during this ſtage, as is uſual in other fevers. They all complained of pain and uneaſineſs about the epigaſtric region; and frequently the liver ſeemed to be enlarged and hard, and preſſing upon it occaſioned conſiderable pain.

Obſtinate

Obſtinate coſtiveneſs conſtantly prevailed, and the common doſes of purgatives had no effect whatever. The ſkin was generally dry, and the heat of the body not much above the natural ſtandard: the urine was not high coloured as in the bilious remittent, or intermittent fevers, but after the febrile ſymptoms diſappeared it generally became yellow, or of a dark brown colour. The fluſhing of the face and the inflammation of the tunica adnata began to abate before the yellowneſs about the neck appeared, this being the firſt part of the body that turned yellow, and the eyes were ſoon after tinged. Theſe appearances, together with an abatement of the febrile ſymptoms, finiſhed the firſt or *febrile ſtage* of the diſeaſe.

As the life of the patient depends almoſt entirely on the treatment during this ſtage (for few have recovered if this was neglected or ill treated) it is of the utmoſt conſequence to pay attention to the moſt diſtinguiſhing or true characteriſtic ſymptoms of this fatal diſeaſe. Theſe are chiefly, an extraordinary fluſhing of the face, redneſs of the eyes, vio-

lent

lent pain in the eye-balls and round the lower part of the forehead, dry skin, a full, soft pulse, not much quicker than natural, and the heat, upon touching the body, found not to be so great as the external appearances would lead us to expect.

For the first three months that this fever raged in Dominica, these were the symptoms by which it was distinguished; but the following year it did not put on such remarkable diagnostic appearances. The flushing of the face, redness of the eyes, head-ach, &c. were less observable, and the feverish period was not so soon over. They had no chilliness on the first attack, the pulse was full and soft, they had a slight delirium, the yellowness did not appear before the fifth day, and many recovered.

There were a few exceptions to this account, but this was the state of our patients in general; and the only difference from the symptoms of the former year appeared to consist in the less degree of violence. An

hœmorrhage from the uterus often occurred, the menſtrual diſcharge was generally exceſſive, and was always a ſymptom of great danger.

About the cloſe of the febrile ſtage, there was often a violent hœmorrhage from the noſe, which was a bad ſign; as was a delirium firſt coming on at that time. In the ſpace of twelve hours after the yellowneſs of the neck, breaſt, and eyes came on, and the pulſe became ſlow, and the heat of the body natural, the black vomit made its appearance, unleſs a plentiful perſpiration had been brought on by medicine, and the vomiting put a ſtop to, or the mouth affected with mercury adminiſtered early in the diſeaſe.

This interval may be termed the *middle ſtage*. In ſome it was very ſhort, and then the diſeaſe proved fatal; if it was protracted to the third day, and the vomiting ſubdued, the patient generally recovered. But to thoſe unacquainted with the diſeaſe, the ſymptoms at this period are very fallacious;

fallacious; the pulse being quite slow, the heat of the body natural, the tongue clean, and sometimes moist; and if the patients are asked how they do? they will reply, very well. And as they cover their faces to avoid the light, a practitioner might be deceived if he did not inquire more into their real situation, and uncover their faces; for from the peculiar appearance of the countenance much is to be learned in regard to life or death in this disease.

The bleeding at the nose now became more violent, and was stopped with great difficulty; the delirium and anxiety increased, some being quite outrageous, and others despondent, muttering and moaning to themselves; and some having a placid, but unnatural smile on their countenances, complaining from time to time of a pain about the epigastric region, and vomiting soon after very dark yellow or green bile. In many, a sort of imperfect hiccup came on about this time; the prickly heat or musquito bites on the body; and the elbows, from leaning on them in the

the act of vomiting, became of a ſcarlet red colour, and the appearance of the true ſkin on the removal of bliſters was the ſame. Some roared with a wild tone of voice, ſhocking to the by-ſtanders, fixing their teeth, and refuſing to take either drink or nouriſhment.

Extreme reſtleſsneſs and anguiſh generally precede the black vomit, which may be ſtyled the *putreſcent ſtage* of the diſeaſe. The hiccup becomes now more evident, and the ſcarlet coloured ſpots on the ſkin and the parts that had been bliſtered put on a pale purple hue. In ſome, blood iſſued from the tongue; and the hœmorrhage from the noſe, in thoſe who had had it before, increaſed to a great degree, and contributed to ſhorten the period of the poor ſufferer's life. What was vomited up at this time, reſembled grounds of coffee, and ſeemed to be ſmall particles of black bile mixed with a ropy mucous fluid and the contents of the ſtomach.

The

The quantity of this black fluid, that was thrown up, is really aſtoniſhing. As the diſeaſe advanced, it became thicker and darker, till at laſt it reſembled the meconium of new born children; the ſtools alſo became black, and had much the appearance and conſiſtence of tar. The hiccup became more violent and more frequent, and a total ſuppreſſion of urine came on. This ſymptom appears to proceed from a total ceſſation of the urinary ſecretion, as attempts have been made to draw off the urine by a catheter but without effect; the bladder having been always found quite empty. If the urine had been paſſed in ſmall quantities at a time during the febrile ſtage, and tinged the linen yellow at the commencement of the ſecond, it was a bad ſign, and few that had this recovered. I never obſerved bloody urine; and no blood was ever vomited up or paſſed by ſtool, except what ſeemed to have been ſwallowed by thoſe who had a violent bleeding from the noſe, which was not a conſtant ſymptom. After vomiting up a quantity of the black matter, the patients always ſeemed to

Like what occurs in Malaria, in which the Blood is discharged

be relieved for a ſhort period from that exceſſive torture that they felt at the pit of the ſtomach; but on attempting to drink, the ſame pain returned, and no liquid could then be retained for a moment on the ſtomach. They had no difficulty of reſpiration; but great anxiety and oppreſſion about the præcordia, and ſometimes a tenſion over the epigaſtric region, but rarely any diſtention of the abdomen. After this the patient began to ſink faſt, the pulſe being now under 60 in a minute and the heat greatly below natural.

I never obſerved cold clammy ſweats in this diſeaſe, which happen ſo often in the laſt ſtage of the bilious remittent fevers of theſe iſlands, when they prove fatal. Nor have I ever obſerved ſubſultus tendinum, which is alſo ſo common in the laſt ſtage of other fevers.

The debility was now ſo great, that the pulſe often ceaſed to beat, while the patient was vomiting, and the colour of the neck, arms, and legs became quite livid. Some were

were delirious at this time, but all were extremely reſtleſs, ſighing, and toſſing about, till a general convulſion cloſed the diſtreſſing ſcene. Theſe were the ſymptoms amongſt young people; but the old and infirm generally fell into a torpid comatoſe ſtate, *after the febrile ſtage was over*, moaning and ſighing till they expired without a ſtruggle. This ſhocking ſtage of the diſeaſe continued generally about twenty-four in ſome thirty-ſix hours; but in others the progreſs of it was ſo rapid that the patient expired in a few hours after it began.

When the diſeaſe finiſhed its courſe in ſeventy-two hours, the different ſtages followed one another in ſuch a rapid manner, that it was ſcarcely poſſible to diſtinguiſh them. It was protracted in general to the fifth day, in ſome to the ſeventh, and in a few inſtances to the eighth or ninth, before death took place. In one patient the yellowneſs continued till the thirteenth day, and as he retained medicines and nouriſhment on his ſtomach, and a number of boils

boils broke out on his face, head, and neck, we entertained hopes of his recovery; but the nurſe having neglected to adminiſter bark and nouriſhing cordials as directed, ſome of theſe boils became gangrenous, and he expired in a convulſion the fifteenth day of the diſeaſe.—In many this putrid tendency was ſo far advanced, before we were called to the ſick, that no medicine or any application whatever ſeemed to have any power or effect in checking its progreſs towards a total diſſolution.

SECTION III.

The Prognoſtic.

WHEN the practitioner was not called in during the febrile ſtage, or until the black-vomit and other putrid ſymptoms had appeared, which happened to be too often the caſe, it was no difficult matter to pronounce with certainty the fatal event of the diſeaſe.—In general few recovered who had a *cold* fit at the beginning of the fever.

If the yellowneſs appeared in twenty-four

or thirty-six hours after the first attack, when the case had been left to nature, or the patients had been bled, and no powerful remedies attempted, they never recovered.—Or whether the yellowness appeared or not, if the fever left great languor and debility, there was no expectation of a recovery.—The sooner the febrile stage ended, when the case was left to nature, or only simple remedies were used, the greater the danger; and, on the contrary, the sooner the fever was subdued by powerful remedies acting in an evident and decisive manner, the greater chance the patient had to recover.—If the debility was not great after the fever, and the yellowness did not appear before the fourth or fifth day, the sick generally recovered.—Many also recovered after the yellowness, and even after a violent bleeding at the nose had begun; but in all my practice I only recollect four patients who recovered after the black vomit had made its appearance.

None recovered after a violent hiccup came on, or a total suppression of urine.

Children,

Children, adults, and old people labouring under the ſmall-pox were conſtantly attacked with this fever, about the time that the ſecondary fever uſually comes on, and none recovered, but thoſe who had begun to take bark and wine after the eruptive fever, and continued this remedy and a nouriſhing diet for ſome time after. It made no difference whether the ſmall-pox were of the confluent or diſtinct benign kind.—All fell victims to this diſeaſe, who were not treated in the manner mentioned above.—Thoſe who recovered of this fever were never attacked a ſecond time, at leaſt no inſtance occurred of it in our iſland, nor in any of the other iſlands, as far as I have been informed.—Neither were they ſubject to be attacked with an intermittent, as thoſe who had recovered from the bilious remittent fever of the Weſt Indies in general are; but they had a very long convaleſcence.

On diſſection, a great quantity of the ſame kind of black viſcous fluid was found in the ſtomach, that had been vomited up

before death.—The gall bladder and the ducts were filled with black bile, of a ropy viscid consistence, and the liver seemed to be enlarged and *soft*, but not otherways apparently diseased; the spleen did not seem to be much affected.—The intestinal canal was filled with a viscid black stuff, of a thicker consistence than that which was found in the stomach, and very much resembled tar, or very thick meconium.

The cadaverous offensive smell of those in a dying state or directly after death, did not appear to me to be so considerable, as it is in those dying of the bilious remittent fever; but the body turned quite black very soon after death.

Section IV.

The French call this fever the Maladie de Siam, for the same reason that it is termed the Bullam fever in Grenada; and sometimes it is also called Maladie des Matelots, on account of sailors being particularly

ticularly liable to it.—The Spaniards call it Vomito-nigro, from the black vomit which never fails to make its appearance towards the close of the disease; but it is of little use to know this distinguishing symptom at so late a period. It appears to be a fever of the typhus kind, and very properly called typhus icterodes in Dr. Cullen's synopsis.—Perhaps the heat (as it is only in very hot weather, or in very hot climates that it appears) occasions that great determination of fluids to the liver, and that extraordinary secretion of vitiated bile, which characterizes this from all other fevers of the typhus kind, and renders it more fatal than any other, the plague not excepted.—I think the term Yellow Fever the best adapted to distinguish it from others, and I have therefore continued it.

I have never seen any publication on this fever since it broke out in the West Indies and America in the year 1793; but I had letters frequently on this subject from my worthy friend Dr. Wright of Edinburgh, now physician to his majesty's

forces in Barbadoes, and I communicated to him from time to time my obſervations on this diſeaſe, and the ſucceſs of my method of cure. I have been informed that it has been conſidered, by ſome authors, as an imported and very infectious diſeaſe; but in this iſland it did not appear to be either imported or infectious. The very few inſtances which ſeemed to indicate contagion, I think may be accounted for on other principles.—Some inhabitants who had been accuſtomed to breathe a cool healthy air in high ſituations in the country, were ſometimes attacked after a viſit to town, in the ſame manner as new-comers from Europe and America, who never had been in the Weſt Indies before; the reaſon of which will be inquired into hereafter.—Thoſe who had reſided long in town, or near the ſea-ſide, were not attacked with it.—The phyſicians and ſurgeons who viſited the ſick, and the nurſes who attended them conſtantly, were not infected, nor did there occur a ſingle inſtance of one of them being ſeized with this fever for theſe three years that I have remained in the iſland, ſince it broke out; altho' no prophylactic, or precaution of any

ſort

ſort whatever, was made uſe of to counteract or avoid contagion. I am therefore of opinion, that this terrible diſeaſe was not imported into this or any other of theſe iſlands, or into America, but that it was produced from natural cauſes. I do not contend, however, that it did not become contagious in ſome meaſure afterwards, in ſome of the towns, ſhips, or other places, in proportion to the degree of concentration of the vitiated air in them, both in this climate and in America. But I ſhall poſtpone my enquiry into the remote cauſes of this fever, until I have treated fully on the method of cure, which is by far the moſt important part of my ſubject, and ought to be particularly attended to.

SECTION V.

Method of Cure.

THE firſt indication is to ſubdue the fever by the moſt ſpeedy means in our power. The ſecond is to prevent the putreſcent ſtate that follows ſo rapidly after the

febrile ſtage, or to oppoſe its progreſs when begun, and at the ſame time to ſupport the ſtrength of the patient. From the remarkable fluſhing of the face, great inflammation of the eyes, and full pulſe in the firſt ſtage of this diſeaſe, young practitioners might be induced to uſe the lancet freely, and the French ſurgeons, whoſe chief remedy in almoſt all diſorders in theſe iſlands is veneſection, very readily fell into this error. There was not a ſingle inſtance of an emigrant recovering who had been bled. The Engliſh practitioners avoided bleeding their patients, and very few of the French, who put themſelves under their care from the beginning of the diſeaſe, died of it. Some time after, a few caſes occurred that ſeemed to require bleeding, and it was employed with ſucceſs; but theſe were new-comers immediately from Europe, who had never been in the Weſt Indies, of a robuſt make, and ſanguine temperament. A pound, and in ſome two pounds of blood were taken away early in the diſeaſe, with ſeeming advantage, and ſome recovered who were treated in this way; but it failed of ſucceſs in others, and at laſt it

was

was laid aſide altogether. It ſhould be obſerved, that we were ſeldom called in time to make uſe of veneſection with advantage, even when a proper ſubject offered. In young athletic people, ſeized with this fever ſoon after their arrival in the Weſt Indies, veneſection to a certain degree may be of uſe, if performed during the firſt twenty-four hours from the attack, but if uſed after that period, or at moſt after thirty-ſix hours, it will always be found prejudicial, if not fatal. It ought to be laid down as a general rule, never to bleed the natives of the Weſt Indies, nor thoſe from Europe, who by reſidence for a certain time have loſt the inflammatory deatheſis in their blood, or in other words are ſeaſoned to the climate. Nor ſhould the officers of the navy or army, or their men, when ſeized with this fever, after having undergone exceſſive fatigue, and expoſure to the violent heat of the ſun in a hard campaign, ever be bled. This rule is founded on experience; and the reaſon is obvious.

Pediluvium

Pediluvium and a purging clyſter were generally firſt ordered, to moderate the violent determination to the head, while more powerful remedies were preparing. Purging was the chief means employed to remove the fever, but the ſtomach could ſeldom be brought to retain the common purgatives: and even when they were not vomited up, a triple doſe was always neceſſary to procure ſufficient evacuations by ſtool. Two drams of jalap were often adminiſtered by degrees, and although all retained on the ſtomach, this large quantity failed to operate ſufficiently, and the little effect it produced was not till ſix or eight hours after it had been taken, whereby much time, which is ſo very precious in this diſeaſe, was loſt. From frequent diſappointments in this way, I was led to add calomel to the jalap, which was ordered to be made up in the following form:

℞ Pulv. jalapii. ℈ij.
Calomelan. pp^{ti} ℈j.
Ol. menthæ guttas iv.
Aquæ fontanæ. q. s. fiat maſſa
in pilulas xvi dividenda.

Of

Of theſe pills ſix or eight were given as ſpeedily as poſſible, with a cup full of cold mint or cinnamon tea, and two or three more repeated every hour till they operated. If they were thrown up, which ſometimes happened, ten grains of calomel were formed into two pills, which were adminiſtered immediately, and repeated in four hours, if they had not operated plentifully before that time. The patients were allowed mint, baſil, or cinnamon tea, or, in ſhort, whatever weak diluents they reliſhed moſt, for their common drink, except cold water; but they were always enjoined to drink very little at a time. Crem. tartar whey was very grateful to the ſick, and was often uſed. After the purgative was ſuppoſed to have operated ſufficiently, if the head-ach was not relieved, a bliſter was applied to the neck, or over the occiput; and a perſpiration was encouraged, by giving warm drinks when the vomiting was not very violent; three or four grains of calomel were given, in a pill, every four or ſix hours, to which ſometimes opium was added,

when

when the purging had a tendency to run to excefs; in the following form:

℞ Calomelan. pp^{ti} ℈i.
Opii puri g^{ta} iv.
Olii cinnamomi guttas iv
Aquæ fontanæ. q. s. fiat in pilulas N° vi. capiat unam omni quarta vel fexta hora.

The ufe of thefe pills was continued during the whole of the febrile ftage, and often for fome days after.—Thefe medicines feldom failed to remove the fever in twenty-four or thirty-fix hours, if the vomiting was not fo violent, that neither medicines nor drinks could be retained on the ftomach, which fometimes happened.—In this cafe a blifter was applied over the epigaftric region, which generally checked the vomiting, and had a good effect when employed early in the difeafe. I found that blifering any other parts of the body than thofe mentioned above, anfwered no good purpofe; that it ferved only to torture the patient, and was even frequently hurtful. Blifter-

ing was ſeldom employed, except when the vomiting could not be ſtopped otherwiſe, and never uſed after the febrile ſtage of the diſeaſe. This was the reſult of experience, for at firſt we tried them in the ſecond ſtage, and found they anſwered no good purpoſe. When there was very little or no inclination to vomit, I added pulvis antimonialis to the calomel, in the following form:

℞ Pulver. antimonialis ℈i.
Calomelanos pp^{ti} g^{ra} x.
Syrupi ſimplicis. q.s. fiat. maſſa
in pilulas viij dividenda *.

Four of theſe pills were immediately given, and two more repeated every ſecond or third hour after, till they had ſome effect. If the firſt four occaſioned a reaching or vomiting, no more were given, and the calomel pills were reſorted to. A grain or two of opium was given afterwards, to ſettle

* Sometimes equal quantities of the antimonial powder and calomel were made up, and divided into the ſame number of pills; and ſometimes James's powder was uſed in the ſame way.

the

the ſtomach and to procure ſleep. If this medicine operated plentifully by ſtool before the opiate was adminiſtered, and a profuſe perſpiration followed, the fever was carried off in twenty-four hours, and the patient recovered; notwithſtanding which, the calomel pills were continued, and the antiſeptic plan purſued for ſeveral days after. When the calomel alone, or joined to the antimonial, operated very powerfully, chicken broth, and panada, or ſago with Madeira wine or old hock, was ordered to ſupport the patient, and ſometimes it was found neceſſary to order an anodyne draught to moderate the operation of theſe powerful remedies. The antimonial or James's powder, when joined to calomel, rarely occaſioned vomiting. Their effects were, commonly, to excite perſpiration and procure a few ſtools. This preparation, however, was not uſed ſo often as calomel alone, or with jalap. The vomiting was ſo much dreaded, that we choſe to truſt to theſe rather than run the riſk of increaſing or exciting this too often fatal ſymptom, by an antimonial of any kind; yet the antimonial thus

combined

combined had a very good effect upon ſome, when adminiſtered very early in the diſeaſe; and in all caſes which are looked upon as very deſperate, it ought to be tried. The doſe of the antimonial, and alſo of calomel, when uſed as an evacuant, may appear to be too large, and even dangerous: but to this moſt deſperate of all diſeaſes, it is neceſſary to oppoſe, very ſpeedily, the moſt powerful, and even ſeemingly deſperate remedies *. The effects of them were, however, generally reſtrained by opium, as before mentioned, when their operation, either upwards or downwards, tended to weaken the patient. None of the French, who were treated in a trifling manner by their own ſurgeons in this iſland, ever recovered. Some indeed were haſtened to their graves by frequent bleedings and the warm bath. Others were loſt for want of active purgatives at the commencement of the diſeaſe; their cure having been, in general, truſted

* Hippocratis Aphoriſm. Sectio i. Aphoriſm 6.

to

to clyſters, ptiſans, and a doſe of manna, or crem. tartar.

After the febrile ſtage, the calomel was continued to be given as an alterative, in doſes proportioned to the apparent danger, with or without opium, according to the ſtate of the primæ viæ. From three to four grains of calomel in the form before mentioned, were adminiſtered every four or ſix hours to an adult, and a glaſs of ſtrong decoction or infuſion of red bark with orange peel, was ordered every hour and a half in the intervals, together with as much nouriſhment and wine as the ſtomach could bear, but always given in ſmall quantities, and often repeated. In this way we proceeded for thirty-ſix or forty-eight hours after the febrile ſtage was over, by which time the fate of the patient in general might be determined; other more ſimple means were ſometimes employed, to oppoſe the ſuppoſed putrid tendency in the fluids, as will be hereafter mentioned. A ptyaliſm rarely took place, but the gums were ſometimes a little affected about the third day, in which caſe the mercury and

every

every other remedy was ſuſpended, and nouriſhment and wine only given; when this happened we could venture to prognoſticate, with confidence, the recovery of our patients. But it was too frequently the caſe, that we were not called to the ſick till the middle ſtage, when the yellowneſs had appeared. At this time we had to combat with great languor and debility, attended with great uneaſineſs at the ſtomach, and a conſtant reaching to vomit.

If a purgative had not been adminiſtered before, a purging clyſter was ordered, and three or four graius of calomel given every five or ſix hours with or without opium, according to the patient's ſtrength; the above antiſeptic plan purſued, and nouriſhment and wine given frequently. If they had been purged, an opiate with calomel or an anodyne draught was ordered, and the alterative pills, and the decoction of bark, &c. given as to thoſe who had been under our care from the beginning. At firſt, as has been before obſerved, we tried a bliſter over the epigaſtric region, but finding it an-

ſwered no good purpoſe at this period of the diſeaſe, it was not continued afterwards. Epithems of aromatic herbs, ſpices, muſtard, and wine, &c. were applied over the region of the ſtomach to check the reaching, but to little purpoſe. Bark in ſubſtance never would ſit on the ſtomach. The ſtrong decoction of the red bark, to which the ſpiritus ætheris vitriolici was added, generally remained on the ſtomach, and agreed better than the common bark. A ſmall tea-ſpoonful of this vitriolic æther was given in four table-ſpoonfuls of this decoction every hour and a half, or two hours. Sometimes this vitriolic æther was given in ſtrong camomile or ſnake-root tea, when the bark was rejected; and when neither of theſe would remain upon the ſtomach, it was given in peppermint-water, or plain water and ſugar, or in what is called ſangree; and in general it proved very cordial to the ſick, and grateful to the palate. Clyſters of the decoction of bark with this ſpirit, or with vinegar or lime-juice, were thrown up every two or three hours; and ſometimes the body was rubbed over with lime-

lime-juice or vinegar. The ſtrained juice of the oxalis, or wood-ſorrel, was given inwardly, and uſed in clyſters, with more evident good effects, in reſtraining the putrid tendency, than any other acid. I knew two patients, who had only taken a few calomel pills, and afterwards by the uſe of this acid, with wine and nouriſhment, recovered, after the ſecond ſtage had made great progreſs, and even after the black-vomit had appeared in one of them, without any other remedy whatever. Elixir of vitriol was tried, but the mineral acids were not found to ſit ſo eaſily on the ſtomach as the vegetable. A glaſs of peppermint-water, from time to time, relieved the uneaſineſs at the pit of the ſtomach, or a few drops of the eſſence was given on a bit of ſugar. When a bleeding from the noſe came on, alum-whey was given for common drink, and the hœmorrhage was reſtrained by a ſtrong ſolution of white vitriol. Great attention was paid to cleanlineſs in the houſes or ſhips where the ſick lay, and vinegar was ſprinkled frequently all over them every day. Branches of

ſhrubs and leaves of trees were ſprinkled with water, and ſometimes with vinegar and water, and put in the windows where the rays of the ſun came, in order to aſſiſt in purifying the air of the rooms by increaſing the quantity of vital air. Vinegar was frequently thrown on hot iron in the chambers of the ſick, with the ſame intention. All this time wine was adminiſtered gradually, either with water and ſome grateful acid, or mulled with ſpices, as the ſtate of the patient required. Pure æther was of little ſervice, the effects of it being ſo ſoon over. Camphor ſeemed to ruffle the ſtomach, and increaſe its irritability, and was laid aſide after a few trials. Muſk had no effect whatever on the hiccup, and being an expenſive remedy, was, after ſix or eight trials, left off. Opium procured ſome reſpite from this ſymptom. Saline draughts, given in the act of effervescence, checked the vomiting for a time, and were really ſerviceable, eſpecially in the firſt ſtage of the diſeaſe. But all theſe means and ſimpler remedies were ineffectual to reſiſt the fatal tendency of the diſeaſe, and were only conſidered

ſidered by us in the light of collateral aids. Our greateſt dependance, or, in the nautical ſtyle, our ſheet-anchor, was mercury. Antiſeptics, tonics, wine, and nouriſhment, were no doubt alſo abſolutely neceſſary, and without which, perhaps, this remedy would have failed of ſucceſs.

I was led to the uſe of calomel in the firſt ſtage, on account of the tardy and ineffectual operation of other purgatives, as before mentioned. At that period, the neceſſity of purging ſeemed to be clearly pointed out, from the evidently violent determination of the circulation to the head. In the ſecond ſtage, the determination appeared to be equally violent to the liver, which was then the principal ſeat of the diſeaſe.

Mercury is known to remove in an extraordinary manner, the principal diſeaſes of the liver, ſuch as the chronic hepatitis, and obſtructions from repeated and long continued attacks of intermittents, and to correct a vitiated or ſuperabundant ſecretion of bile, and alſo to cure the dyſentery ſup-

poſed to proceed from thence; all which no other medicine yet diſcovered, is poſſeſſed of ſuch power to effect: And as every indiſpoſition or complaint ariſing from an over ſecretion of bile, ſo common in the Weſt Indies, is moſt ſpeedily and effectually removed by calomel, employed as an alterative as well as a purgative, I was induced by analogy to continue the uſe of mercury with this intention, after the febrile ſtage was over, and it has fully anſwered my expectation. In a few caſes of this fever, where there was an evident enlargement of the liver, and where the inceſſant vomiting prevented our throwing in a ſufficient quantity of calomel in a ſhort time, I uſed frictions of ſtrong mercurial ointment over the hypochondria and epigaſtric region. If the gums were affected by the rubbing, all went on well. But this method of cure was not ſufficiently purſued, owing to the trouble that it gave to the nurſes. I think it a good practice in all caſes where we are much preſſed for time, or ſuch as are conſidered to be very deſperate. In hoſpitals it ought to be attempted, eſpecially

eſpecially on ſuch patients as can ſcarcely retain medicine or drink on their ſtomach for a moment, which happens very often, and theſe are always looked upon as truly deſperate caſes. After the black-vomit has made its appearance, there is little to be hoped from any remedy. But to ſhew the powers of mercurial friction, I cannot but add, that in two caſes of idiopathic tetanus; I ordered a pound of mercurial ointment to be applied by friction to each, in the courſe of three days, by which the gums were affected, the ſpaſms abated, and both patients ſpeedily recovered. The dry belly-ach, which is alſo a violent ſpaſmodic malady, is likewiſe cured by mercurial frictions, as well as by calomel; for this diſeaſe is removed as ſoon as the mercury affects the mouth, which happens generally before ſtools are procured; and even when a plentiful alvine evacuation takes place, the ſymptoms are ſeldom if ever removed entirely, till the mercury takes effect. In ſhort, I am convinced from long experience, that mercury is fully as uſeful, and as indiſpenſably neceſſary for the cure of all

diſeaſes of the bilious and ſpaſmodic kind between the tropics, as the Peruvian bark is in the remittent and intermittent fevers of all warm climates. Without the aid of theſe two invaluable remedies, perhaps few Europeans who viſit hot climates, would live to return to their native land. I tried the ſea-water bath on ſome patients, who could not retain medicine. A large pailful or two of cold ſalt water was thrown over them four times a day, and after being well dried, they were covered, and had ſome warm mulled wine or ſangree given to them. This ſeemed to have a good effect for a ſhort time, and it appeared to retard the progreſs of the diſeaſe; but it did not, upon the whole, ſucceed well in this Iſland; probably from its having been in general tried when too late; for my friend Dr. Archbald of the iſland of Nevis, certainly employed this method of cure often with ſucceſs; and I have heard that it has alſo ſucceeded ſometimes in Jamaica. It ought to be uſed after a purging clyſter, or after a purgative, but not after mercury has been adminiſtered. Our confidence in mercury,

prevented

prevented our making more frequent trials of ſea-bathing, as the uſe of both at the ſame time we conceived to be incompatible.

When called early in the ſecond ſtage of the diſeaſe, we found that by the uſe of mercury, a ſteady perſeverance in the antiſeptic plan, good nurſing and care, many of our patients recovered, and ſome even after the black-vomit came on, as was mentioned before, in whom however the other mortal ſymptoms, ſuch as violent hœmorrhage from the noſe, hiccup, and ſuppreſſion of urine, were wanting.

But in the worſt caſes, or ſuch as had been neglected at the beginning, where the ſeptic proceſs had got ſuch a firm hold of the ſyſtem, that it proceeded with a gradual but ſteady ſtep, increaſing in violence every hour, till at laſt a total diſſolution of the whole ſyſtem took place, no remedy that we tried ſeemed to have any power even to retard, much leſs to reſiſt its fatal progreſs.

From

From a firm belief that this diſeaſe was by no means contagious in our iſland, the ſick were not abandoned by their friends, nor neglected by their attendants, which contributed very much to the recovery of many who would otherwiſe have been loſt for want of care. When the opinions of medical gentlemen, who practiſe phyſic in the Weſt Indies or America, lean to the ſide of this being a very infectious diſeaſe, it is of the utmoſt conſequence to conceal them as much as poſſible from the attendants on the ſick, and even to hold out a contrary opinion, for otherwiſe the ſick will be abandoned to their fate; and the dread of infection will operate ſo powerfully on the minds of the people, that many will be ſeized with the diſeaſe when it becomes more frequent, and the air is farther vitiated, who, if not influenced in this manner, might have eſcaped an attack. A ſtrong confidence in ſome, that a diſeaſe is not infectious, and a great fortitude of mind in others, who conceive it to be ſo, or their firm reliance on ſome favourite plan of pre-

vention, are perhaps the greateſt preſervatives * we know againſt any contagion.

* When I make uſe of the plural "we," I mean my friend Dr. Fillan of Dominica, who had an equal ſhare of the buſineſs with myſelf, and of courſe followed the ſame method of practice.

CHAP.

CHAPTER II.

SECTION I.

The Method of Prevention.

WHEN the diſeaſe was become frequent and raged with violence, many new-comers from Europe were attacked with it in eight or nine days after their arrival; ſome were ſeized a fortnight after, of theſe I knew three young men from 13 to 15 years of age, who arrived the ſame day on the iſland, and were attacked that day fortnight all about the ſame hour, one of whom died the fifth day, and the other two recovered; but of theſe I only attended one, who was cured by mercury. Many were not ſeized till after a month or ſix weeks reſidence; and I remember one inſtance of a perſon dying of this diſeaſe, after he had been nine months in the Weſt Indies, and had viſited other iſlands. But, in general, the attack upon new-comers was during the firſt month

month or ſix weeks after their arrival. Officers of the navy and army were rarely attacked during the ſevere fatigues of a campaign, and even when expoſed to the violent heat of the ſun; but in a few weeks after they were relieved from it, and repoſe ſucceeded to exceſſive exertion and anxiety of mind, very few eſcaped an attack. Emigrants who had endured much fatigue in their flight, had lived on poor nouriſhment, had bad lodging and little ſleep, and who had been haraſſed by the influence of fear, grief, and exceſſive heat, all of which are powerful pre-diſpoſing cauſes, were attacked almoſt to a certainty in a week or ten days after. When this fever prevails, I found one bleeding neceſſary for new comers of a ſanguine temperament and a robuſt make, and a cooling purgative the next day; and ordered them to live chiefly on a vegetable diet and fruits, and to avoid the heat of the ſun as much as poſſible, and to take ſome cooling laxative medicine frequently during the firſt month or ſix weeks. But lately my chief dependance was on mercury. A purge of calomel and jalap was firſt given,

given, and frequently repeated, or a few grains of calomel were given once or twice a day till the gums were affected, and a purgative afterwards; and soon after, this course was renewed without confining the patient, and after this some bark was generally ordered every day for a week or more. Few could be prevailed upon to continue the mercurial course long enough, and fewer still to renew it, but such as did were not attacked. On the arrival of Europeans, a few calomel purges in the course of the first ten days, with a vegetable diet, and the moderate use of wine, together with bark for several days after, and the renewal of the calomel purges and bark from time to time during the first two or three months residence, was the most common method employed to prevent an attack, and it was generally successful. It is worthy of remarking, however, that a strong dose of calomel was commonly given upon the least indisposition, or appearance of an attack, and bark in infusion or otherwise taken for some days after. The officers of his Majesty's navy and army, who have leisure, and can be

be prevailed upon, on their arrival, to undergo one or two gentle courſes of mercury, taking a few laxative medicines after, confining themſelves to the moderate uſe of wine, and living chiefly on vegetables and fruits for the firſt two months, may rely almoſt to a certainty on eſcaping this fever. But if the nature of the ſervice requires their exertions immediately, which has generally been the caſe ſince this fever firſt broke out, a few briſk calomel purges as ſoon as poſſible after their arrival, and bark at intervals during the ſervice that they may be upon, will generally ſecure them againſt an attack. But as ſoon as the ſervice is over, they ought then to be moſt attentive to prevent an attack, and not to neglect, if poſſible, taking calomel for ſeveral days, and bark afterwards. The ſame plan ought to be followed in regard to the ſailors and troops in theſe iſlands, but this muſt be attended with much difficulty, and I ſhall not preſume to adviſe the medical gentlemen of the navy and army on this head. Their own experience has no doubt pointed out to them the readieſt and ſafeſt mode of adminiſtering

miniſtering medicines, and alſo the beſt method of treatment; my intention here being only to recommend, in the ſtrongeſt manner, the liberal uſe of mercury when an opportunity offers, both as a preſervative againſt, as well as an effectual remedy for this fever; and in the former caſe, to fortify the conſtitution by the plentiful exhibition of bark, continued for ſome time, eſpecially after a hard campaign, or great fatigue and expoſure to the exceſſive heat of the ſun. The emigrants could not bear much purging; one doſe of calomel and rhubarb was ſufficient for them, and bark afterwards, renewing the purgative occaſionally. This method ſecured all againſt an attack, who were under our care in this iſland. Some new comers, who eſcaped this fever by the means above-mentioned, had ſome months afterwards an attack of the remittent bilious fever, or of an intermittent, neither of which are dangerous diſeaſes when attended to in the beginning, being conſidered here as only a ſeaſoning to the climate.

CHAP-

CHAPTER III.

SECTION I.

An Inquiry into the remote Cauſes of this Fever, at Dominica, and in the other Iſlands, and in North America.

1ſt. DURING the hurricane months of the year 1792, there was very little thunder in this iſland, and the weather was very ſultry. From the month of January to the 15th of June 1793, when this fever firſt broke out, the weather was extremely calm, and much hotter than uſual in this, as well as the neighbouring iſlands. There was little rain till the 15th of October.

2d. We had no thunder in the months of May and June, nor in the autumn of the year 1793, which had not been the caſe here for twenty years before. This circum-

ſtance was alſo remarked in the other iſlands.

3d. Fahrenheit's thermometer, in the months of June, July, Auguſt, and September of the ſame year, generally roſe to 88 or 90 degrees, and ſometimes to 92°, between the hours of two and four o'clock, P. M. when placed in a large room, with all the doors and windows left open to admit freſh air, as is cuſtomary in the Weſt Indies. At ten o'clock at night it ſeldom fell below 80°, and at daylight in the morning, which is the coldeſt time of the twenty-four hours, 79 degrees was the loweſt. When the thermometer was carried about in the ſtreets of the town, it roſe to 110 degrees; and when hung up in the ſun, the mercury was ſoon at 120°.

In former years the thermometer had been frequently obſerved to riſe to 90 and even to 92 degrees, in the autumnal months; but it never continued long at this height; for the cloudy weather, heavy rains, and

thunder ſtorms, which never failed to happen at that ſeaſon, cooled the atmoſphere. The heat, for ſome months before, and during the continuance of this fever in the iſland, eſpecially in the night-time, was almoſt inſupportable. The variation in the riſe or fall of the mercury in the barometer in theſe iſlands is ſo little, that keeping an account of it did not appear to me to be of conſequence.

4thly. I was informed by a gentleman, who was in North America when this fever broke out at Philadelphia, that there had been no thunder before, and very little during the autumn of 1793, whilſt it raged with ſuch violence, and that the weather at that time was exceſſively hot and cloſe. It has been remarked all over North America, that the weather had been much hotter in the ſummer and autumn of the two laſt years, and that there had been very little thunder during all that time, in compariſon with former years; neither had there been any of the uſual violent gales of wind upon the coaſt for the three preceding autumns. In the

autumns of 1794 and 1795, this fever prevailed in Charles Town, Norfolk, and New York; it broke out in the latter on the arrival of great numbers from Ireland, and in the two former, on the arrival of crowds of emigrants from St. Domingo and the other islands. According to Dr. Lining's account of this fever in Charles Town, South Carolina, communicated in the Essays Physical and Literary, Vol. II. it appears to have broke out there in the years 1732, 1739, 1745, and 1748; he thinks it was always imported from the West Indies, but gives no proof, or even reason, in support of this opinion, which does not seem to be well founded.

5thly. This fever has not prevailed much in these Windward Caribbee Islands for many years past. At Fort Royal, in Martinique, where there is a great prevalence of mephitic effluvia, arising from the marshy ground at the back of the town, it generally broke out in the summer or autumnal season, on the arrival of troops from France, or of a number of seamen, who never

ver had been in the Weſt Indies before; and the ſame thing happened at Point à Petre, in Grand Terre, Guadaloupe, almoſt annually, and from the ſame cauſe; but it was never looked upon as an infectious diſeaſe, nor did it ever ſpread among the natives of the towns, or among thoſe who were ſeaſoned to the climate, nor was it ever carried from thence to the other iſlands. In this iſland but few caſes have occurred for theſe laſt twenty years, and theſe have chiefly been at Prince Rupert's Head, where, from the ſtagnated water in a large moraſs near the town and fort, the marſh miaſma prevails in a high degree. Since the ſwampy places which were in the town of Roſeau have been filled up, this fever has been ſeldom obſerved; but previous to the year 1792, we had generally violent thunder ſtorms, heavy rains, or ſevere gales of wind, during the autumnal ſeaſon.

M. Diſportes, in his Hiſtoire des Maladies de St. Domingue, during the fourteen years that he kept a journal of the diſeaſes at Cap François and Fort Dauphin, found that

this fever broke out conſtantly in theſe towns upon the arrival of new-comers from France, and among theſe, only ſuch as had not been formerly in that climate; and at the time it raged, which was chiefly during the autumn, the old ſeaſoned inhabitants were only attacked with bilious remittents, and, what he terms, the lymphatic fever, which ſeems to have been more of the typhus kind, than of the bilious, but very different from the yellow fever. Dyſentery alſo prevailed among the ſeaſoned inhabitants at the ſame time. In and about theſe towns, during theſe fourteen years, viz. from the year 1732 to 1746, there were a great many inlets of the ſea, where the water continued long in a ſtagnated ſtate, which in ſo hot a place produced very offenſive exhalations; to theſe he attributes this fever, and the bilious and other diſeaſes that prevailed at the ſame time. He mentions little in regard to the general ſtate of the weather, or even as to gales of wind, or thunder and rain, and having no thermometer, he could give no accurate account of the degrees of heat.

6thly.

6thly. I have obſerved, for many years paſt in this iſland, that when we had much thunder and very heavy rains in the months of June and July, we always eſcaped a hurricane, or a ſevere gale of wind. On the contrary, if we had fine weather in theſe months, we had either a hurricane, or a very ſickly ſeaſon after. If that ſevere ſcourge of the inhabitants of the Weſt Indies took place, by which the whole country was laid waſte, and deſolation was every where to be ſeen, the inhabitants had better health, than is uſual at that time of the year, to compenſate them for their great loſſes and calamities. This was obſerved in all the iſlands that ſuffered by the ſevere hurricane of 1780. It was verified here; although we had only, what is called, the tail of it. And in the year 1787, after two very violent hurricanes in one week in this iſland, the inhabitants were extremely healthy; but it was health dearly purchaſed.

7th. In the months of June, July, and Auguſt 1794, we had ſome ſlight thunder ſtorms, and this town was not ſo un-

healthy afterwards; although many had this fever, and ſome died of it. In the ſame months in 1795, the thunder was more ſevere; we had bilious complaints and intermittent fevers all over the iſland, but this fever almoſt diſappeared; and only a few caſes occurred afterwards. I have had no information in regard to the ſtate of the weather either in Jamaica or St. Domingo, during the three laſt years, that this fever has proved ſo deſtructive to our countrymen there.

By the exceſſive and long continued heat of the ſun, the ſtate of the atmoſphere appears to be ſo much vitiated in all warm climates, that if ſome agent or means were not employed from time to time by nature to rectify it, theſe countries would become unfit for the reſidence of human beings.

Thunder, heavy rains, and violent gales of wind ſeem to be the agents for this purpoſe; which are the cauſes of reſtoring that due mixture of parts to the atmoſphere, ſo indiſpenſably neceſſary for the ſupport of health.

A ſtrong

A ſtrong gale of wind, which is the moſt powerful inſtrument made uſe of for effecting this purpoſe in all climates, and which, from its periodical or frequent returns in the warm ſeaſon, is called in the Eaſt Indies and about the coaſt of Africa, tornado; in the Mediterranean ſea, levanter; on the coaſt of North America, northweſter; and in the Windward and Leeward Weſt India Iſlands, hurricane. Theſe winds produce but too often the moſt dreadful effects both by ſea and land, but they ſeem to be directed by Providence for the good of the whole, at the expence of the few. The other agents anſwer likewiſe the purpoſe of purifying the air, although in a much leſs degree. The want of theſe correctives, as they may be termed, for impure air, left it in a ſtate truly obnoxious to general health, which I think was, moſt probably, the remote cauſe of this fever.

It was remarked, after the arrival of ſuch multitudes of people at Roſeau, at the time when this fever had begun to rage with violence,

lence, that the air had a flat kind of ſmell, and that people ſoon became faintiſh in it, on uſing even very moderate exerciſe. This induced me to make trial of the air, by Mr. Scheele's ſimple apparatus, not having a proper eudiometer. The purity of the air is perhaps aſcertained more accurately in this way, than it can be by the nitrous gas, which depends ſo much upon a variety of circumſtances in the ſeparation of it from the acid of nitre. I filled, at different times, gallipots with liver of ſulphur, and alſo with iron filings and flower of ſulphur well mixed and moiſtened, and put theſe upon a ſtand under a glaſs veſſel, which was placed on a ſtool in a pail of water. The glaſs veſſel was marked and divided on the outſide, and allowance being made for the ſpace that the gallipot occupied, the water roſe only one-fifth in the glaſs veſſel, after ſtanding twenty-four hours. When the diſeaſe abated, it roſe near one-fourth; and upon many trials afterwards, when the place became more healthy, the water never roſe above one-fourth, which makes about twenty-

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five parts of vital air that was taken up, but perhaps it was not entirely abſorbed.

The air in the mountains of this iſland is very pure, and remarkably ſalubrious. I aſcertained the heights very accurately of the places in the vicinity of the town, where the inhabitants were never attacked with any fever, but of the catarrhal or inflammatory kind, and where the people live to a great age; and to which, when the emigrants had fled, they always avoided an attack of fever, or ſoon recovered if in a convaleſcent ſtate: The elevations are as follow:

	Feet high above the level of the ſea.	
N° 1. Bruce's Hill - - -	360	Pleaſant and healthy, but not ſo much ſo as Daxon's Hill.
2. The outer Cabritt, at Prince Rupert's Head, is - - -	600	More healthy than the inner Cabritt, and pleaſant.
3. Daxon's Hill - - -	1010	Very healthy.
4. One Tree Hill, and the environs about the ſame height - -	1300	Remarkably healthy.
5. Mount Pleaſant Eſt -	1360	Ditto.
6. Petit's Houſe, called Teneriff - - -	2050	Cold and rather damp, and not ſo healthy as the other places.

The places alluded to above.

Although

Although ſituations only from 400 to 600 feet above the level of the ſea are healthy and pleaſant, yet it appears from the foregoing experiments, that the air is purer and more healthy from the height of 1400 to 1500 feet, than it is when much below or above that height; in the latter caſe it becomes damp and raw, and by experience I find the inhabitants are not ſo healthy in ſuch high ſituations. I could not aſcertain the proportion of vital air in the atmoſphere at theſe heights, for want of a proper eudiometer; Mr. Scheele's apparatus having been found quite inconvenient for that purpoſe; but this I will endeavour to have tried exactly, on ſome future occaſion. If the troops on their arrival in the Weſt Indies could be quartered in ſuch high ſituations for a little time, till they got accuſtomed to the heat of the climate by degrees, ſo many of them would not be loſt. Where this is impracticable, they ſhould if poſſible be landed in theſe iſlands in the month of December or January, which are the cooleſt times of the year.

Theory.

Theory. This derangement of the component parts of the atmoſphere, was probably effected by the ſtrong light and intenſe heat of the * ſun having diſengaged, or formed ſome combination with its vital part, or a certain portion of it, which being ſo united and rarified, would riſe far above that ſtratum of air, in which we, in lower ſituations, breathe, leaving the mephitic or heavier part near to the ſurface of the earth. The loſs of a ſmall portion of vital air, would render this lower ſtratum very unfit for reſpiration, and of courſe very unwholeſome to live in.—The atmoſphere of this town became probably vitiated in this manner by degrees, and therefore did not affect the health of the inhabitants either ſuddenly, or very conſiderably. The common remittent fever, dyſentery, and other bilious complaints, had, however, begun to ſhow themſelves, previous to the appearance of the yellow fever.

* M. de Fourcroy's Preliminary Diſcourſe, in his Elements of Natural Hiſtory and Chemiſtry.

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The air already thus deranged, was, by the ſudden arrival of a number of perſons greatly exhauſted, and unprovided with changes of cloathing, and alſo crowded together in an extraordinary manner, ſo contaminated with mephitic exhalations, and exalted to ſuch a pitch of malignancy, that all who had been accuſtomed to breathe a purer air, viz. the Europeans, Americans, thoſe from high ſituations in the mountains, as well as the emigrants, who, as mentioned before, were prediſpoſed by a multiplicity of cauſes, would all be readily and greatly affected by it. If the conſtitution is able to reſiſt the firſt attacks of the common bilious remittent fever, occaſioned by reſiding in the neighbourhood of marſhy places, experience has ſhown us that by habit the baneful influence of theſe mephitic vapours will be entirely overcome, and that ſuch perſons having eſcaped ſome attacks of this kind, may continue to live in ſuch an atmoſphere, and enjoy as good health, as people in general do, in Weſt India towns. But the animal œconomy is not only influenced by habit in all its parts, but it has alſo a power of conformity

formity to almoſt any change, either of increaſe or decreaſe of nouriſhment, or of labour, as well as of reſt, confinement, want of ſleep, &c. &c. as it has alſo of breathing a foul unwholeſome air with little apparent injury to health, provided any or all of theſe variations or ſtates of life, are brought about gradually. The direction of our ideas, and the powers of thinking and acting, are in all caſes influenced by cuſtom. For theſe reaſons, probably, new-comers are ſpeedily attacked with this fever after their arrival, even in places where it does not prevail, and this gives it ſo much the appearance of an infectious diſeaſe, where it has already broke out.

A deranged ſtate of the atmoſphere, as mentioned before, ſeemed to me to be the firſt cauſe that excited this mortal diſeaſe in our iſland; and as it prevailed in the different towns of the other iſlands, the more they were crowded with ſtrangers, I am inclined to believe, that it proceeded from the ſame cauſe in them all, aided, and perhaps put in action, by the great concourſe of people

people in towns exposed to so much heat. New-comers from Europe, in high health, were soonest affected by this impure air; others, who had resided some time in unwholesome places in America, and in the French islands, resisted its baleful influence much longer; and perhaps, by the extraordinary or immoderate accumulation of it, in some West India and American towns, even the old inhabitants were sometimes affected with this fever. In this way, many fevers of the typhus kind may become more or less epidemic, which are not in themselves contagious, as is always the case in the jail and ship fevers. I believe the air did never arrive at that contagious degree of accumulated impurity in this island: For when patients labouring under this fever, were removed to high situations for the sake of breathing a cooler and purer air, and who, notwithstanding, fell victims to it, the people about them were never infected, nor did the disease ever prevail afterwards in such places.—And I have been assured that this was exactly the case in America. There appears to have been such an extensive

ſive and very peculiar deranged ſtate of the atmoſphere in the towns in theſe iſlands, and in North America, that it is more probable, this diſeaſe was produced by this general cauſe, breaking out nearly at the ſame time in different places, than that it originated only in one or two towns, and was carried from thence by infection to others, by either perſons or goods, as has been ſuppoſed. The regular return, and continuance, of this fever in the months of July, Auguſt, and September, every year, more or leſs, ſince its firſt appearance in theſe iſlands, and in the towns in America, ſeems to me to argue ſtrongly in favour of this opinion. From theſe facts and obſervations I am of opinion, that in all hot climates, where a great depravity of the atmoſphere is produced by the cauſes already mentioned, and where its natural purifiers are wanting, this fever will break out in ſuch places, on the arrival of a great number of ſtrangers, more eſpecially if they come from a cold country. If ſuch impure air is allowed to be the remote cauſe of this fever, as appears from what has been ſaid; the air in reſpiration, in

this case, not having a sufficient quantity of oxygene, may occasion a deranged state of the fluids, which I conceive to be the immediate stimulus or excitement, or what may be termed the proximate cause of this fever. And if the biliary secretion be intended for the discharge of the degenerated lymph and crassamentum of the blood, as Dr. Maclurg thinks, in his dissertation on the bile; the great redundancy and degeneracy of the bile in this fever may be easily accounted for on that principle. This derangement may be the cause of an increased determination of the fluids to the liver, and as the morbid animal process gains ground, which it does every hour, if not opposed by powerful remedies, the liver becomes more and more distended with blood, and the biliary secretion is increased and hurried on in such a rapid manner through the extremities of the pori biliari, that it resembles grounds of coffee rather than bile, which, upon a narrow inspection with a magnifying glass, seemed to be black dissolved blood, floating in lymph or mucus. When the blood, dissolved by this morbid process,

proceſs, meets with any obſtruction, it guſhes from the noſe and mouth in almoſt a colourleſs ſtate, and in ſuch prodigious quantities, that the patient ſoon ſinks into a ſtate of total diſſolution.

Query. Is it poſſible to diſcover a method to purify the atmoſphere of a town, or to deprive it of the ſuperabundant quantity of mephitic gas, ſo deſtructive to animal life?

Fire has been formerly employed as a purifier of the air, wherever great malignancy of it was ſuſpected; but ſince the diſcoveries of the late Monſ. Lavoiſier and others, ſhewing that combuſtion deprives it of a portion of the vital part ſo eſſential to life, ſome doubts may be entertained in regard to the propriety of uſing great fires on ſuch occaſions. But it may ſtill be a queſtion, whether the good effects of fire, eſpecially in ſhips and cloſe chambers, may not be accounted for from the rarefaction and conſequent influx of freſh air which it occaſions?

Burning of brimstone and other combustible substances in the holds of ships, and also in prisons and hospitals where bad air prevailed, has been found useful in purifying it. Might not a large fire of wood placed twice a day at the leeward side of hospitals, where the sick of this fever are, be of some service in purifying the air? Leaves of vegetables wetted and placed in the sun's rays in the windows and doors on the windward side of hospitals or houses where the sick are placed, in the West Indies, as mentioned before, may contribute in a small degree also to purify the air. Perhaps the explosion of gunpowder in some convenient parts of the towns in the West Indies and America where this fever prevails, two or three times a day, would be useful in a general way; or, what is better, the deflagration of nitre, or small quantities of moist gunpowder, might be useful to purify hospitals in the inside, or to the leeward of them, in houses and in private practice. This might be tried at a small expence in the West India islands, where cannon powder is so soon damaged in the different gar-

riſons by the exceſſive humidity of the air, at ſome ſeaſons of the year.

But all artificial means yet diſcovered can avail but little, and even the frequent thunder ſtorms that we have had for theſe two years paſt, which, although of infinite uſe in moderating the diſeaſe, ſeem to be too weak agents to reſtore the atmoſphere to its wonted ſalubrity. A hurricane, that terrible ſcourge of the Weſt India planter, appears to be the only agent now ſufficiently powerful to effect that purpoſe. And a violent gale of wind (called north weſter), together with ſevere thunder ſtorms, on the ſouthern part of North America, are equally neceſſary to diſſipate the impure air in their towns, and thereby remove from them, for a term of years, this dreadful diſeaſe.

OF THE BILIOUS REMITTENT FEVER OF THE *WEST INDIES*.

CHAPTER I.

SECTION I.

THIS Fever is the ſame in all the Weſt India iſlands, and probably in all hot climates, differing only in the degree of violence, according to the greater or leſs prevalence of its remote cauſe, which I conceive to be marſh effluvia.

The Symptoms.

IT begins with a chilline ſs, giddineſs, and head-ach; ſenſe of great weakneſs, ſickneſs at the ſtomach, and pain of the back. There is a peculiar uneaſy ſenſation all over the

the ſurface of the body; the eyes look heavy, the countenance is pale and dejected, the ſkin dry, and the pulſe feeble and very quick. Great anxiety and reſtleſſneſs ſoon follow; and when the ſenſe of cold wears off, a violent vomiting of yellow or green bile comes on. The contents of the ſtomach are generally thrown up during the chilly fit, together with what the patient has drank, for the thirſt is then very great. The heat of the body is now increaſed; the pulſe becomes fuller, the face flushed, and a redneſs of the ſkin appears, particularly about the breaſt. The tongue is dry and white, and in grown people the pulſe is generally from 90 to 100 ſtrokes in a minute. The patient becomes extremely reſtleſs, the vomiting is inceſſant, and ſometimes a delirium comes on. In this ſtate the ſick remain from 8 to 12 hours, about which time a ſlight moiſture appears, firſt on the face and breaſt, and afterwards by degrees all over the body. When the ſweat was general, and continued for an hour or two, and the vomiting ceaſed, a remiſſion of fever followed. But more frequently the

ſweating was partial, and did not continue long; the pungent heat on the ſkin remained, the vomiting was renewed, and the paroxyſm prolonged for 8 or 12 hours more. The urine is always high coloured from the very firſt ſymptom of the diſeaſe, and continues ſo throughout. The firſt paroxyſm generally begins in the evening, or about eleven o'clock A.M. The patient is languid and confuſed after the firſt fit, his ſkin ſoon becomes dry, the heat continues to be greater than natural, he is not quite free from head-ach, and on ſitting up or walking about, he feels a dizzineſs in it. This remiſſion generally continued for 8 or 12 hours, when another paroxyſm came on, ſometimes with a ſenſe of coldneſs, but more frequently with a great ſenſe of heat all over the body; the head-ach increaſed, and the vomiting ſoon became more violent than it was in the firſt fit. All the ſymptoms were now much more violent, and the paroxyſm generally continued 18 or 24 hours, when a ſweat came on; which, if profuſe, a remiſſion followed. When the patient had not taken any medicine, this remiſſion

miſſion was of ſhort duration, ſeldom continuing more than 4 or 6 hours. In the third fit there was ſeldom any rigor, the exacerbation came on with violent vomiting, increaſed head-ach and heat, and all the febrile ſymptoms were much higher; the tongue became very dry and foul, the thirſt intolerable, and the eyes more inflamed; which ſymptom, however, diſappeared during the remiſſion. The delirium and anxiety were increaſed, and the enſuing remiſſion was very imperfect, running into a fourth exacerbation or paroxyſm in a few hours, which often proved fatal on the fifth day, if no medicine or bark had been given from the beginning, or if the patient had been treated improperly, by bleeding, warm baths, or large doſes of emetic tartar. The patient in this caſe either became quite delirious, or fell into a comatoſe ſtate. At the height of this paroxyſm the heat is greatly increaſed, and ſo pungent, that a diſagreeable ſenſation remains upon the ends of the fingers after feeling the patient's pulſe and ſkin. The pulſe now beats 120 times in a minute; and towards the cloſe of

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the ſcene, I have counted it at 130 or 140. The breathing is now very laborious; and there is generally a ſubſultus tendinum, trembling of the hands, feeling the bed cloaths, catching at ſomething in the air, ſtaring, talking and muttering, till the patient is ſnatched off ſuddenly by a ſort of convulſion; or they ſometimes remained in an inſenſible ſtate for many hours, breathing with great difficulty till they expired. Coldneſs of the extremities, and cold ſweats, are always ſymptoms of great danger, and ſeldom fail to appear in the laſt ſtage of this diſeaſe. I have never obſerved petechiæ; but ſome hours before death the ſick had a cadaverous ſmell, the face and extremities put on a livid appearance, and the ſtools were very offenſive. I have never met with any patients in this fever who had a bleeding at the noſe, and though hiccup is very common, yet it is not always a mortal ſymptom, as it is in the yellow fever. Muſqueto bites, and prickly heat, generally diſappear on the firſt attack. A ſuppreſſion of urine does not come on, nor is it ever of a yellow colour, as in the yellow fever, except in ſuch as have the

jaundice

jaundice as a concomitant ſymptom. On the contrary, it is remarkably high coloured, reſembling porter, both during the remiſſions and in the paroxyſms. When the fever came on without any rigor or chilly fit, the greater was the danger; the remiſſions being more imperfect. The contrary of which happened in the yellow-fever. When there was much rain in the months of May and June, and dry ſultry weather prevailed in the following months of July and Auguſt, this fever raged much among the troops and ſtrangers, and ſometimes proved fatal when not attended to at the beginning, or when improperly treated. In general, however, it was not ſo very violent or rapid in its progreſs as deſcribed above; it reſembled a double tertian intermittent, with this difference, that the paroxyſms were much longer and more violent, and the intermiſſions were never ſo perfect, or ſo clearly marked. When the remiſſions and paroxyſms ſucceeded one another ſo rapidly that there was little time to adminiſter the bark, a doſe or two of James's or the antimonial powder, and a bliſter between the ſhoulders,

generally

generally brought about an intermiſſion or a good remiſſion, and then the bark was adminiſtered as quickly as poſſible, and generally with ſucceſs. In young children this fever ſometimes came on with a convulſion fit, or they had one when the hot fit was at its height; which being frequently ſuppoſed to proceed from worms, and being treated for ſuch, precious time was loſt, and the diſeaſe thereby often proved fatal. A fever proceeding from worms in the Weſt Indies I never found to be very violent, or ever preceded by a cold fit, nor were there any remiſſions or exacerbations. This ought to be ſtrictly attended to; as many children have been loſt from this miſtake. The voiding of worms is no certain indication that the diſeaſe proceeds from them, although it is a very difficult matter to perſuade the parents or nurſes that it does not. The more violent and diſtinct the paroxyſms, the greater certainty there is that it is really of the remittent kind. Some grown people had a ſenſe of torpor, or numbneſs in their extremities upon the firſt attack of this fever, and others had a temporary privation of ſight, which occaſioned

great

great alarm; but theſe ſymptoms were not followed by fatal conſequences, probably owing to the great care, and extraordinary attention that was paid to thoſe who were attacked in this ſeemingly dangerous way.

I have ſeen many inſtances of a yellowneſs of the eyes coming on, and ſpreading all over the body about the fifth day, which was at firſt a very alarming ſymptom; but by experience it was found not to be a dangerous one. It ought to be obſerved, however, that in theſe caſes, the paroxyſms and remiſſions of fever were clearly and diſtinctly marked; and alſo, that in thoſe who died of it, the black-vomit never appeared, as it did conſtantly and uniformly in all caſes of the yellow-fever which proved fatal. The yellowneſs coming on in a fever, with evident remiſſions and paroxyſms, may be therefore looked upon as only an accidental jaundice, and unconnected with it in any other way; which is far from being the caſe in the yellow-fever.

Although

Although ſome medical gentlemen have ſuppoſed the yellow-fever to be contagious, as I obſerved in my hiſtory of it; few, if any, I believe, will contend for this fever being ſo. In theſe iſlands, no practitioner of my acquaintance entertains any ſuch opinion; and I am fully convinced, from long experience, that it is not infectious. The conſtant ſupply of freſh air by the trade-winds, and ſea and land breezes, probably render diſeaſes very ſeldom contagious in this climate. The effluvia from rich low lands after much rain, have nearly the ſame effects upon the human conſtitution in producing this fever, as the marſh miaſmata, or the vapours from ſtagnated water about the mouths of rivers or inlets of the ſea have, only differing in degree. Theſe bring on intermittents more or leſs violent, while the ſtrong marſh effluvia produce this fever. Strangers are more liable to the deleterious influence of theſe mephitic vapours than the natives are, or thoſe who have been ſeaſoned to ſuch climates, as was obſerved of the yellow-fever; but there ſeems ſomething different in the general

general ſtate of the atmoſphere, as mentioned before, which renders it leſs dangerous. While this fever attacked ſtrangers in July and the autumnal months, the natives and ſeaſoned inhabitants were ſometimes attacked with intermittents.

The uniform and regular diſpoſition to remit, eaſily and readily diſtinguiſhes this from the yellow-fever. Neither the redneſs of the eyes, nor the flushing of the face, are ſo remarkable, and they always diſappear during the remiſſions. The reſpiration is laborious during the paroxyſm, and the pulſe always quick and hard, which is never the caſe in the yellow-fever. A conſtant vomiting of bile accompanies every paroxyſm of this fever from the very firſt attack, which does not happen ſo early in the other. This is an invariable ſymptom throughout the diſeaſe. And farther, a remiſſion or evident abatement of the febrile ſymptoms, takes place always in the courſe of twelve hours after the firſt attack, and the paroxyſm is renewed ſome hours after, which is never the caſe in the yellow-

fever,

fever, as I have ſhewn in the firſt part of this work.

Section II.

Of the Cure of the Remittent Fever.

As there is generally a want of appetite, always a ſickneſs of the ſtomach, head-ach, an uneaſy feeling all over the body, or ſome indiſpoſition for a day or two before the firſt attack; five or ſix grains of calomel at this period, and a briſk purgative given eight hours after, will often entirely prevent the fever, or abate its violence conſiderably if it comes on, ſo that the conſtitution will not be injured by it; eſpecially if ſix or eight doſes of bark are taken daily for three or four days after the purgative. When called during the firſt paroxyſm, if the retching and vomiting were violent, a few cupsful of camomile tea were given to cleanſe the ſtomach; and ſoon after, a purging draught, conſiſting of from one to

two

two ſcruples of jalap in cinnamon or mint water. If this did not remain long enough on the ſtomach to have the deſired effect, a clyſter was ordered, and ten grains of calomel and half a dram of jalap made up into ten pills, four of which were given at firſt, and two every half hour afterwards till they operated. Theſe were ſeldom vomited up, and were found to be the moſt efficacious purge of any that was tried. The neutral ſalts were ſo often vomited up, that I have laid them aſide altogether for ſome years paſt, and uſed the draught or pills, which has anſwered the purpoſe much better. Six or eight ſtools procured by theſe means relieved the head-ach and vomiting, a ſweat generally followed, and with it a remiſſion of all the febrile ſymptoms. The uſe of the Peruvian bark was begun as early as poſſible, in ſubſtance, if the ſtomach would bear it, or in ſmall doſes of the powder in two ounces of a ſtrong decoction or infuſion of it every hour or hour and a half during the remiſſion. It was ſometimes neceſſary to give an anodyne draught after the purgative, to quiet the ſtomach previ-

ous to giving the bark. At other times a cup of ſago or panada with wine, anſwered the purpoſe of ſettling the ſtomach. The pale bark in ſubſtance was preferred to the red, although the latter made the ſtrongeſt decoction or infuſion, which was given when the powder would not ſit on the ſtomach. If an ounce of bark in ſubſtance, or half that quantity in a pint of the ſtrong decoction or infuſion, was retained on the ſtomach during the firſt remiſſion, the ſecond paroxyſm would not be very ſevere, and the ſame quantity given in the ſecond remiſſion, would generally prevent a third fit. Purgatives ought conſtantly to be employed during or towards the decline of the paroxyſm, in order not to loſe time in giving the bark, when the remiſſion takes place. It is however worthy of obſervation, that it requires a very large doſe of any purgative to have a proper effect during the hot fit of the fever; and on that account the purgatives were generally poſtponed till the violence of the paroxyſm was over. When the patient was not viſited till the firſt remiſſion, and no medicine had been

given, a purging clyſter was ordered; and a doſe of bark made purgative by the addition of ten or fifteen grains of jalap was given immediately, and the bark in ſubſtance or otherwiſe, was adminiſtered as often as the ſtomach could bear it afterwards. If not called to the ſick till the ſecond paroxyſm, a purgative was ordered; or if he had been purged during the remiſſion, which generally happened, five * grains of James's powder or eight grains of the pulv. antimonialis were given to an adult, and repeated every two or three hours, till ſome ſenſible effect was produced by it. A grain or grain and a half of pure opium was frequently given to ſettle the ſtomach after the antimonial, and to prepare it to retain the bark, which was always exhibited as ſoon as poſſible.

When the head-ach was very violent in this paroxyſm, and more eſpecially if the patient

* I am inclined to think from repeated trials, that one-third part more is required of the p. antimonialis Londinenſis, than of the James's powder, to produce the ſame effect on the ſame perſon.

was delirious, a large bliſter was applied to the neck, which ſeldom failed to remove both. If the vomiting became more ſevere about the end of this, or the beginning of the third paroxyſm, and could not be reſtrained by ſaline draughts in the act of effervescence, or by a grain or two of ſolid opium, a bliſter was applied over the epigaſtric region, which ſeldom failed to put a ſtop to it in a few hours. Muſtard was applied over the pit of the ſtomach, when bliſtering on that part was not thought ſafe or proper, and it often had a very good effect. The bark was mixed up in different vehicles, according to the taſte or whim of the ſick, as in wine, wine and water, porter, toaſt and water, &c.; but in general cold coffee with a little ſugar, covered the taſte of it better than any other liquid, and made it ſit more eaſily on the ſtomach. The taſte of it is alſo very well covered by milk, and in this way it was commonly given to delicate people and to children. When the bark purged, five drops of laudanum were added to each doſe, or fifteen drops to the firſt doſe, which never failed

to

to prevent its running off that way. If on the contrary it occaſioned coſtiveneſs, ſome calcined magneſia was rubbed with the bark, or five grains of jalap added to a doſe or two every day, which kept the bowels ſufficiently open. The ſame quantity of jalap ſeemed to purge more when joined to the bark, than when given alone. The infuſion of bark was made with boiling water, when wanted quickly, and at other times it was made in cold water, in lime water, or with magneſia in water.

When the ſtomach rejected the bark in every form, which ſometimes happened, it was given in clyſters, either in a ſtrong decoction cold, with ſome of the powder, or the powder mixed up in thin ſtarch jelly. In the former caſe two drams of the powder with the decoction, and in the latter half an ounce of the powder, were thrown up every two hours, thirty or forty drops of laudanum having been previouſly added to the firſt clyſter, to prevent their being ſpeedily diſcharged. By this method many were ſaved, who would have died, if no

attempt had been made to employ the bark, when the ſtomach had conſtantly rejected it after repeated trials. The bark was applied externally all over the abdomen of children as well as given in clyſters, when they could not keep it on their ſtomachs; and they generally paſſed a number of worms by the purgative of jalap and calomel given previous to the bark. When no bark had been given during the third remiſſion, the ſucceeding paroxyſm was very violent, and a delirium or coma enſued, in which caſe a bliſter was applied to the head, and ſinapiſms to the feet and hands, The great debility at this period very often prevented our attempting to uſe the James's or antimonial powder, although it was ſometimes adminiſtered with ſucceſs in caſes that were looked upon as deſperate. But in general, as much bark, wine, and nouriſhment at intervals, was given as the ſtomach would bear. A hiccup was a common ſymptom at this period, and it was always very diſtreſſing to the patient, and in ſome inſtances continued to the laſt moment of his exiſtence. It was often relieved by laudanum,

laudanum, and ſometimes by muſk. Camphor was always hurtful by irritating the ſtomach, and increaſing that dreadful ſymptom an inceſſant vomiting.

After the patient had been purged, and dangerous or alarming ſymptoms appeared, the bark was given at all times when the ſtomach would bear it, and it was applied in every way, without any regard to remiſſions or exacerbations of fever. Nouriſhment and wine was given between each doſe of bark, or as often as poſſible, and freſh air admitted into the chambers of the ſick by every means. When a paroxyſm was attended with only a ſlight delirium, but with great reſtleſſneſs and anxiety, thirty or forty drops of laudanum gave great relief, and often brought about a ſweat and remiſſion of fever.

I have never bled any perſon in this fever, and although I have heard of veneſection being employed with ſucceſs on ſome young robuſt men, when attacked ſoon after their arrival from Europe, yet I am of opinion that

it is ſo hazardous an operation that it ought hardly ever to be attempted. I have been confirmed in this opinion from having ſeen thoſe to whom I have been called, after they had been bled, almoſt always in ſuch a ſtate of debility, that no cordials or any means whatever were ſufficiently powerful to prevent their ſinking entirely in the ſucceeding paroxyſm. Emetic tartar increaſes the irritability of the ſtomach, and ought never to be uſed in any ſtage of this diſeaſe. I have known many fall victims to the imprudent, or raſh application as it will perhaps be called, of this medicine; but as we have ſafer remedies at hand, it is better to lay aſide the uſe of it entirely in this fever. When the ſtomack is foul, and the bile that is thrown up is very thick and ropy, I have ordered an infuſion of ipecacuanha with a view to cleanſe it, which this ſimple medicine always effected without increaſing its irritability.

In general, very few died of this fever, who were treated in the manner here recommended; and I think I can aver with truth, that I have not loſt more than one patient

patient out of fifty, when I have been called to their aſſiſtance during the firſt or ſecond paroxyſm, and even very few after the third. Much, however, depends on the early and liberal adminiſtration of the bark. Though I have never been able to obſerve any thing like critical days in this fever, yet I have never known any perſon die of it after the eighth day.

If the bark was not continued daily for a week or ten days after the fever was ſtopt, an intermittent of the double tertian or quartan type came on, which was very difficult to be removed, rendered the patient very weak and his convaleſcence very long. It is abſolutely neceſſary to enforce the uſe of the bark for ſome time after, and to keep the bowels open until the ſtrength is thoroughly reſtored. Camomile or ſnake-root tea, to which ſometimes elixir of vitriol was added, every morning early, and at eleven o'clock, contributed much to reſtore the appetite. Riding on horſeback every morning early, and removing to a high ſituation in the country when it could be done conveniently, was always recommended.

If

If, as before mentioned, the indiſpoſition previous to an attack of this fever be attended to, and five or ſix grains of James's powder, or ſix or eight grains of calomel to a robuſt perſon be given before the fever is formed, and a purgative next day, an attack may generally be prevented. Or if the ſkin is very dry, and there is already ſome fever, a good doſe of the antimonial or James's powder will anſwer the purpoſe better, and by purging and ſweating, prepare the patient for the uſe of the bark, which ought never to be omitted.

CHAP-

CHAPTER II.

SECTION I.

Of Intermittent Fevers.

I HAVE not met with a regular quotidian fever in this iſland; the fit generally came on in the morning of one day, and in the afternoon of the ſucceeding, and when particular attention was paid to the ſymptoms, the firſt paroxyſm was found to be more violent than the ſecond, and the fever ſeemed to partake much of the double tertian type.

In the moſt regular tertian type of this fever, there is generally ſome anxiety and uneaſineſs, or a ſlight febrile attack, about eleven o'clock in the forenoon, or in the evening of the day of the intermiſſion, which is not often attended to, but conſtitutes alſo in ſome degree a double tertian type. In what is called the tertian ague, anticipations

of

of the paroxyſms are very common, which if not prevented by bark will run into one another, and form a real double tertian of a more or leſs dangerous tendency, according to the duration of the intermiſſions. From what I have obſerved of intermittents in this and ſome of the other Weſt India iſlands, I am inclined to think that the double tertian and the quartan types are the only real diſtinctions amongſt them. From my own experience I am alſo of opinion, that the remittent fever follows the ſame periods in regard to remiſſions, and paroxyſms or exacerbations, as the double tertian intermittent does, differing only from it in degree of violence.

The quartan type, in general, is very diſtinctly marked, its paroxyſms returning very nearly every ſeventy-two hours. The cold fit of an ague does not continue ſo long here as it generally does in cold climates, ſeldom exceeding half an hour; but the longer it continues, the more complete and durable the ſucceeding intermiſſion always

ways is, and the leſs danger is to be apprehended.

Intermittents, when neglected or treated improperly, bring on fixed affections of the liver, ſuch as ſenſible hardneſs and enlargement, and in ſome caſes the ſpleen is alſo enlarged and hard. Theſe obſtructions are generally followed by dropſy, particularly after the quartan.

Although purging is not a neceſſary preparative to the uſe of the bark, a doſe of jalap was generally given; or if the patient had vomited much bile during the former fit, a calomel pill was ordered, and a purge of jalap next morning. But in urgent caſes, where the intermiſſions were ſhort, a ſcruple of jalap was ordered with the firſt doſe of bark, and the bark was given every hour or hour and a half in dram doſes, during the intermiſſion. When the tongue was very foul, and a quantity of thick bile had been thrown up in the former paroxyſm, half a dram of ipecacuanha in powder, or an infuſion of two drams of the root in a tea-cup full of boiling

boiling water, was ordered to be given on the appearance of the firſt ſymptoms of the cold fit, which not only cleanſed the ſtomach, but alſo ſhortened the paroxyſm, and in ſome inſtances entirely removed the diſeaſe. A grain and a half or two grains of tartar emetic given to robuſt people, on the firſt approach of the cold fit, produced frequently the ſame good effect. When the type of the ague was aſcertained, I did not begin the bark till eight or ten hours before the ſevere fit of a double tertian, or twelve hours before the fit of a quartan, giving a dram in ſubſtance every hour or hour and a half till the time the fit was expected, and generally ſome doſes afterwards, as the bark frequently retarded the paroxyſm and made it leſs violent, when it had not ſufficient powers to prevent it entirely. Thirty or forty drops of laudanum given to a grown perſon in the hot fit, had a good effect in bringing on a ſweat ſpeedily, ſhortening the fit, and ſettling the ſtomach, ſo as to enable it to retain the bark better the next intermiſſion. The pale bark has been preferred of late to the red, the latter having been found

found often to ruffle the ſtomach and occaſion great uneaſineſs in it. I have found by experience, that an ounce of bark given in the courſe of the eight or ten hours preceeding the paroxyſm of an intermittent, had more effect in ſtopping it, than double that quantity had when taken at a conſiderable diſtance of time before the cold fit. From this fact well eſtabliſhed, I have been able to cure intermittents with one half the quantity of bark or leſs, than has been uſually employed for that purpoſe. Three or four doſes taken on the fever days only, a few hours previous to the time the fit was expected, was ſufficient in general to prevent it; but to ſecure the patient againſt a relapſe, the bark ought to be continued in this way for at leaſt ten days or a fortnight after the fit has been ſtopped. If no more bark is taken than what is barely ſufficient to ſtop a paroxyſm, which, from the averſion people in general have to this remedy, is too often the caſe, a relapſe or return of fever will take place the eighth day in the double tertian, or what is commonly termed the quotidian ague; and in the imperfect

double tertian, or tertian type, as it is called, the relapſe will happen on the fourteenth or fifteenth day, and in the quartan on the twenty-firſt or twenty-ſecond, making in each type, nearly ſeven periodical revolutions of the diſeaſe from the time the fit was ſtopped to the next attack. I have obſerved, when relapſes happened at this time, that on reckoning backwards the days and periods of the fever, it was found that the fit returned on the ſame day, and nearly at the ſame hour, that it would, if its courſe had not been interrupted from the commencement by the bark. Theſe relapſes will often happen independently of any irregularity of regimen, to which they are commonly imputed. I am inclined to aſcribe theſe periodical returns of intermittents, more to a certain habit contracted in the conſtitution, than to any influence of the moon over the body, as has been conceived by ſome phyſicians. But as great alterations in the weather generally take place about the changes of the moon in this climate, eſpecially in the autumn; and as convaleſcents are more readily affected by ſuch viciſſitudes, I commonly ordered two

or

or three ounces of bark to be taken by thoſe recovering from an attack of fever, two or three days before every full and new moon, for ſome months, which effectually prevented relapſes of this kind. It is neceſſary to obſerve here, that when intermittents have been neglected or improperly treated in the beginning, and are become fixed in the habit, as it is generally termed, the bark will not ſucceed without the previous uſe of mercury, as in ſuch caſes obſtructions of the liver are brought on, eſpecially in the quartan type, as before obſerved, which can only be removed by a gentle courſe of mercury. I have known may inſtances of quartans having been perfectly cured in this way. When anaſarca comes on after repeated attacks of a quartan, obſtructions of the liver are to be ſuſpected; and if a hardneſs of the liver or ſpleen is diſcovered on examination, mercury ſhould be adminiſtered without loſs of time, otherwiſe a confirmed dropſy will ſoon follow, and the diſeaſe will prove fatal. If the anaſarca proceeds from debility, or continues after the obſtructions are removed, a change of climate becomes neceſſary;

ſometimes removing to the cool air of the mountains in this iſland, has anſwered the purpoſe of reſtoring the patient to health; but if circumſtances will admit of a voyage to a colder climate, the reſtoration of health will be more certain, and the opportunity of obtaining it ought not to be loſt.

The bark of the cinchona caribæa, or cinchona brachycarpa, called country jeſuits bark, both lately diſcovered in this iſland, is alſo effectual in intermittent fevers. I have cured obſtinate quartans with bark of the cinchona brachycarpa * in powder, and the tertian ague with the cold infuſion of both of theſe barks; but when the brachycarpa is given to white people, it is neceſſary to throw away the firſt infuſion, as it is extremely bitter, and ſeems to poſſeſs ſomething of an emetic quality. The ſecond infuſion is not ſo ſtrong, but cures common intermittents in a few days. Upon eſtates among the negroes, the firſt infuſion anſwers the pur-

* Some experiments have been made on this bark, by Mr. Brand, apothecary to the Queen, which will probably be publiſhed.

poſe of a preparative to the uſe of the bark, as it commonly vomits and purges gently, and a quart of the ſecond infuſion given every day for two or three days after cures the fever. The cold ſecond infuſion is a good ſtomachic, and may prove a very uſeful remedy for dyſpepſia. I prefer the bark of the cinchona brachycarpa, but it as well as the caribæa ſeems to be ſomewhat deficient in the aſtringent quality poſſeſſed by the cinchona officinalis; I therefore ſometimes added a little of the bark of the * prunus ſpharoſpermus, called bois tanne by the French, being a large tree, the bark of which is uſed for tanning leather, to the infuſion, which I ſuppoſed contributed to render it a more powerful febrifuge.

The white arſenicated drops, prepared as directed in the London Medical Journal, ſucceeded very well in a few caſes of intermittents, but it has not been brought into

* The bark of the prunus ſpharoſpermus is remarkably aſtringent, probably more ſo than the oak bark. It is uſed in decoction to check diarrhœa or lienteria.

general uſe yet in theſe iſlands. It bids fair however to be a uſeful remedy among the negroes, and robuſt hardy people. The ſafeſt method of uſing it in the Weſt Indies, where the nurſes are generally negro women, is to mix it with water, ſo that a table ſpoonful of the mixture may contain five drops, by which means miſtakes will be avoided.

CHAP.

CHAPTER III.

SECTION I.

Of the Typhus Fever.

FEW caſes of the real Nervous Fever have occurred in this or the other iſlands, as I have been informed, for many years paſt. When it has occoured in this iſland, keeping the patient open in his bowels, bliſtering the head repeatedly, giving a decoction of bark and ſnake root, and ſupporting the ſtrength with nouriſhment and wine, were the means employed for the cure; and in general with ſucceſs. Two caſes occurred where the diſeaſe was protracted to the twentieth day, and both recovered. In ſome of the other iſlands, as I have been informed by medical gentlemen, it has been treated with great ſucceſs, by throwing cold ſea-water over the patients, three or four times a day, in the manner directed by Dr. William Wright, late of Edinburgh, now phyſician to the army in

the Weſt Indies, a ſituation he is well qualified for.

Section II.

Pleurisy, Piripneumony, and Catarrhal Fevers, and Gaſtratis, &c. have not occurred often in this iſland. When there are evident ſymptoms of local inflammation, bleeding largely and frequently is abſolutely neceſſary, eſpecially in the pleuriſy; and ſtrong doſes of the antimonial or James's powder and calomel were given afterwards, otherwiſe the diſeaſe proved ſpeedily fatal. Fomentations and bliſtering the ſide affected muſt not be neglected; and cooling emolient drinks, ſuch as barley-water with ockra, to which ſome nitre is added, ſhould be given frequently. The blood in this and the hepatitis, which has occurred often in this iſland*, had always a thick inflammatory buff upon it. If bleeding is not uſed very

* See my paper on abſceſſes and diſeaſes of the liver in the Weſt Indies in Decade 2d, Vol. IV. p. 317, of Edinburgh Medical Commentaries.

early

early and plentifully in gaſtratis, a mortification of the bowels ſoon follows, and the patient is carried off in the courſe of three days illneſs.

A catarrhal fever, called a cold, ſeldom requires bleeding; but a doſe or two of P. antimonialis or James's powder is very often neceſſary to remove it. Ten grains of the former, or ſix of the latter, was the common doſe given to grown people.

Bleeding in the acute hepatitis ſhould be employed very early and largely, as well as in the pleuriſy, to prevent an abſceſs forming in the liver.

As the dyſentery generally prevails at the ſame time that remittent and intermittent fevers do, in the Weſt Indies, and probably proceeds from the ſame cauſe, I ſhall next give a ſhort account of the method of treatment that I have found moſt ſucceſsful in that diſeaſe for many years paſt.

CHAPTER IV.

SECTION I.

Of the Dyſentery.

THE accurate deſcription that has been given of this diſeaſe by ſo many eminent authors, renders it unneceſſary for me to enter upon the diagnoſis; I ſhall therefore proceed to the method of cure.

I have never found occaſion to uſe veneſection. If the fever ran high, and the excruciating pain and griping in the bowels were not relieved by warm fomentations and emollient clyſters, the ſemicupium was ordered, which never failed to alleviate them for a time, but it was ſeldom repeated, as it evidently weakened the patient: on which account, when the pain returned with violence, a bliſter was generally applied over the abdomen. While theſe applications were employed to palliate the diſeaſe,

diſeaſe, an infuſion of ipecacuanha in the following form was preparing, viz.

℞ Pulveris. craſſi. radicis ipecacuanhæ ʒij. aquæ bullientis ℥viij. Macera in vaſe fictili per horas quatuor. Cola liquorem, et capiat cochlearea vi. vel viij. ſtatim et iv. omni ſemi hora donec vomitus excitetur.

About one half of this infuſion was given as ſoon as poſſible, for time is as precious in this diſeaſe, as it is in all thoſe already treated of; and if that quantity did not excite vomiting or great nauſea in half an hour, four ſpoonfuls more were given, and ſo on till it operated upwards and downwards. It ſhould be obſerved, that this quantity was ordered for an adult, one half being ſufficient for weakly or young people. The doſe was always eaſily proportioned to the age and ſtrength of the patient, as it never operated with violence, even when given in large doſes. When the ſick ſtrained much in vomiting, a few cups of camomile

camomile tea or warm water were ordered; but if they vomited with eaſe, no liquid was ordered to excite it. Chicken water, very thin ſago, or jelly of the arrow-root ſtarch, was given for drink and nouriſhment afterwards; emollient clyſters were thrown up twice or thrice a day, and ſometimes an anodyne was ordered at night.

The ſame ipecacuanha was infuſed for four hours or all night, and the infuſion repeated next morning, and frequently it was infuſed a third time, and given the third morning; but two infuſions generally anſwered the purpoſe of cleanſing the primæ viæ, and from twenty-five to forty drops of laudanum given in two ounces of the ſame infuſion at night, for ſeveral nights after, very often completed the cure. If this infuſion did not operate ſufficiently by ſtool, which it ſeldom failed to do, an ounce and a half of the oleum ricini, made up in the form of an emulſion with gum arabic or the yolk of an egg, was given on the ſecond or third day, and the infuſion with laudanum was continued at night, or the

ſame

ſame number of drops were added to a ſtarch clyſter. A ſolution of ſal cathartic amarus in mint water, was ſometimes ordered as a purgative, which anſwered very well when it remained on the ſtomach, but as that was not often the caſe, the caſtor oil was generally preferred. The continuance of the anodyne in the above form for three or four nights more, together with emollient lubricating nouriſhment and drinks, was all that was neceſſary in common caſes to remove the diſeaſe.

But when it was very violent from the beginning, or had made great progreſs before the patient was viſited, the infuſion was given, and repeated till it had operated very well by ſtool; the anodyne, as mentioned before, was ordered every night, and the following decoction given in the daytime, viz.

℞ Pulver. craſſi. corticis. Peruvian. ʒij.
—— Catechu vel gumi. kino. ʒij.
Aquæ fontan. ℔iij. coque leni igne ad

ad ℔ ij. cola et adde ol. cinamom guttas iv.

Capiat ʒ ij vel ʒ iij ſecunda vel tertia quaque hora.

When the diſeaſe did not yield to this treatment in two or three days, ſome affection of the liver, occaſioning a vitiated ſecretion of the bile, was ſuſpected to be the cauſe of it; and if on examination that viſcus was found to be enlarged, hard, and painful when preſſed upon, a calomel pill with opium was given three or four times a day; and when there ſeemed to be danger, and the caſe became urgent, a dram of ſtrong mercurial ointment was rubbed in frequently at the ſame time, till the gums were affected. The pills were made up in the following form:

℞ Calomelanos pp^{ti} ℈j

— Opii puri g^{ra} iij. in aquæ q. s. ſoluti.

— Ol. cinamomi guttas iv. miſce et divide in pilulas xv

Capiat unam ter de die.

If

If frictions of mercurial ointment were uſed at the time theſe pills were ordered, two were ſufficient in the twenty-four hours; but if the cure was truſted entirely to the pills, three or four were given in that ſpace of time, till a ſoreneſs of the gums came on, or until the diſeaſe was removed. During this courſe the decoction of bark was continued, to prevent a putrid tendency in the diſeaſe; and nouriſhment of the moſt lubricating kind, ſometimes with wine, to ſupport the ſtrength of the patient, was ordered. The patient was well watched, and the mercury immediately ſuſpended, if it affected the gums.

The chronic hepatitis, as I have obſerved in a former publication *, was almoſt conſtantly preceded by a purging of vitiated acrid bile, which very often brought on a dyſentery, and an abſceſs of the liver always followed, if mercury was not adminiſtered early in that diſeaſe. Sago and panada were uſed as nouriſhment for the ſick; but, of

* Edin. Medical Commentaries, Decade 2d, Vol. IV. p. 317.

late

late years, the ſtarch of the maranta or arrow-root of the Weſt Indies has been uſed as an emollient aliment, when made into a jelly, for people afflicted with dyſentery, or any other complaint of the bowels. Wine, ſugar, and ſpices were added to it, as was found neceſſary, and ſometimes milk. This ſtarch has been found remarkably uſeful in ſuch complaints, often removing them without much aſſiſtance from medicine. The utility of it has been confirmed by experience, and having been found preferable to ſago, in all caſes when both were uſed, the cultivation of it ought to be encouraged; and if the importation of it from our colonies, could be permitted under certain reſtrictions, it would be found much preferable to every other aliment in diſorders of the bowels, and might be employed as ſuch in our hoſpitals, and in our navy and army, and thereby prove a great ſaving in the article of ſago and ſalop, now in ſuch general uſe. The ſtarch of the arum eſculentum, called eddo or tanier in the Weſt Indies, is equally fine and pure, and would probably be as beneficial as that of the arrow-root,

but

but it has not been ſo often tried. In ſome caſes of complaints of the bowels, this root has been found very uſeful, and being more productive in the article of ſtarch, it could be prepared at a much cheaper rate, and would probably anſwer the ſame purpoſe *.

When a diarrhœa or lienteria followed the dyſentery, the arrow-root ſtarch with milk and a milk diet, ſeldom failed to remove it, and reſtore the ſick to health. It was very often neceſſary to uſe lime-water, at the ſame time, in the milk; a pint a day taken by degrees mixed with milk was ſufficient, and aſſiſted in forwarding the cure. The decoction of bark with aſtringents was uſed for ſome time, when the milk diet was not thought adviſable. Sometimes a very weak decoction of ſimarouba, or an infuſion of quaſſia root in water, was taken daily to the quantity of a pint with good effect. The quaſſia root was alſo infuſed in port wine, and

* See my paper on the comparative quantities of ſtarch, produced from the roots of Weſt India plants, uſed as food by the inhabitants, publiſhed in the London Medical Facts of this year.

a wine

a wine glaſs full of it given three or four times a day with advantage. Wine was never uſed after a milk diet was begun. Flannel was ordered to be worn over the abdomen of thoſe recovering from this diſeaſe, to prevent a relapſe; and it is neceſſary to avoid vegetables and acid fruits, and to pay great attention to diet, with the ſame view.

Section II.

General Remarks.

In the treatment of the dyſentery, I have chiefly truſted, for many years paſt, to the early uſe of ipecacuanha infuſed in the manner before directed; and I can take upon me to aver, that this practice has been attended with extraordinary ſucceſs. This may be conſidered as only the renewal of an old practice, viz. that of G. Piſo, which I do not deny; but I think it of little conſequence whether a practice is old or new, provided that it is found by experience to be ſucceſsful. Many may probably aſſert, that ipecacuanha

ipecacuanha in powder given in ſmall doſes, has been equally ſucceſsful in curing the dyſentery. To which I ſhall only reply, that I have not found this to be the caſe. The powder ſeldom purges, or ſo little that purgatives muſt be had recourſe to, by which time is loſt. The infuſion always purges effectually, and its effects are more durable than thoſe of the powder, and it does not fatigue or weaken the patient. It may probably impart to water its chief virtues, as the Peruvian bark does, but the preference appears to depend on its action as a gentle emetic, and a powerful purgative, at the ſame time, without inducing debility, by which means the diſeaſe is not allowed to gain ground nor to fix on the bowels, which a dilatory method of treatment permits it to do, and when this had been the caſe it too often reſiſted every remedy that was tried. Tartar emetic induces debility, and, on that account, ſhould never be employed in this diſeaſe in hot climates, where the ſtrength is ſo quickly exhauſted, and frequently cannot be reſtored again by any means in our power.

I have placed my next great dependence on mercury for the cure of this diſeaſe. It often proceeds from obſtructions or a chronic inflammation of the liver, which occaſion ſome derangement of its ſecretory or excretory organs, the cure of which can only be effected by this remedy. In general, when a diſeaſe occurs in the Weſt Indies, with ſuch ambiguous ſymptoms, that it cannot with certainty be referred to any particular claſs, ſome affection of the liver may be ſuſpected, and under ſuch circumſtances this really happened very frequently to be the caſe.

A gentle courſe of mercury for bilious complaints, even where there is no evident hardneſs of the liver, will generally prove beneficial to health in hot climates, where this viſcus is ſo often the ſeat of diſeaſes, which can only be removed by that powerful remedy, as far as we yet know.

CHAP-

CHAPTER V.

Of the Dry Belly-Ach.

SECTION I.

Hiſtory of the Diſeaſe.

THIS is the moſt painful of all the diſeaſes to which the inhabitants of the Weſt Indies are liable.—It begins with a ſickneſs at the ſtomach, and great uneaſineſs about the umbilical region, which abates and returns at intervals of between ten minutes and a quarter of an hour, which become more violent every time, till at laſt a ſevere retching and vomiting comes on, which is renewed as often as the pain returns.—Equal compreſſion over the abdomen gives a temporary relief from pain, and this circumſtance, with the abſence of fever and the want of a diſtention of the bowels, are the leading ſymtoms that diſtinguiſh this diſeaſe from the gaſtritis.

The bowels ſeem to be contracted and drawn backwards, or cramped as the patient generally expreſſes it. In the courſe of twelve or twenty-four hours the pain ſometimes becomes ſo excruciating, that the poor ſufferer falls into convulſions, which is always a ſymptom of great danger, and in which I have known inſtances of people expiring.—The torments of thoſe labouring under this diſeaſe are beyond conception, and excite the commiſeration of all who attend them, which is probably the reaſon, that practitioners have ſo often recourſe to opium for their relief.—A difficulty of voiding the urine comes on, and ſometimes a total ſuppreſſion of it.—Clyſters are never retained long, and when the diſeaſe continues for twenty-four or thirty-ſix hours with great violence, the anus is often ſo much contracted, that a clyſter-pipe cannot be introduced, without great difficulty. The retching and vomiting frequently became ſo violent, that even anodyne draughts were inſtantly thrown up. The pulſe was always natural during the firſt twelve or twenty-four hours of the diſeaſe,

eaſe, but generally became quicker and weaker afterwards.—The heat of the body was natural at firſt, but after two or three days continuance of the diſeaſe, it was much under the natural ſtandard, and often accompanied with cold ſweats. Obſtinate coſtiveneſs always prevailed, and the common means to procure ſtools were often employed with unremitting aſſiduity for four or five days to no purpoſe. I have been called to ſome patients who had been in torture for ſeven days without having had a ſtool; and I viſited one the eighth day, who had not had an evacuation by ſtool all that time, but it was then too late to afford him any relief, for a mortification of his bowels had taken place, and he died the next day. The fatal termination of the above caſe, in this way, induced me afterwards to take eight or twelve ounces of blood from robuſt people at the commencement of the diſeaſe.—Few caſes, however, occurred that required veneſection, as the people afflicted with it had generally a pale yellow complexion, and were more or leſs ſwelled or bloated from drinking grog, drams, or

ſtrong punch.—Only the lower orders of the white people in the Weſt Indies, and the negroes, who cannot afford to drink old rum or wine, are ſubject to attacks of this diſeaſe.

Relapſes happen very often, and ſometimes bring on a degree of palſy, which is more or leſs difficult to be removed, in proportion to the preceding attacks. Although every patient ſuffers extraordinary pain during the attacks, yet there is great variety in the degrees of violence.

It is by no means a dangerous diſeaſe when atended to at the beginning, but its frequent recurrence often wears out the conſtitution, impairs the faculties of the mind, and renders a removal to a temperate climate abſolutely neceſſary. Or to thoſe who have not the means to enable them to go to Europe or America, a total abſtinence from ſpirituous liquors ſhould be ordered, and even inforced, if poſſible; and drinking the hepatic or Souffriere waters,

waters, which are to be found in moſt of theſe iſlands, ſhould be ſtrongly recommended.

SECTION II.

Of the Cure.

WARM fomentations, applied to the abdomen, afforded only a momentary alleviation of the pain, as did the ſemicupium, which always weakened the patient and was ſeldom repeated.—Clyſters were always given and frequently repeated, but to little purpoſe.—A bliſter applied over the epigaſtric region ſometimes ſtopped the vomiting, by which means mild purgatives, as ſal. cathart. amarus, or an emulſion of caſtor-oil was retained on the ſtomach, and being frequently repeated, had at laſt the deſired effect.—But as bliſtering had not often this good effect, and tended to increaſe the ſufferings of the patient, I have laid it aſide for many years paſt.—Draſtic purges always increaſed the vomiting, and never anſwered the purpoſe for which they were given.

Two grains of ſolid opium generally ſettled the ſtomach and allayed the violent ſpaſms in the bowels, after which an emulſion of caſtor-oil, given and repeated at proper intervals, ſometimes ſucceeded in procuring ſtools, although never till after many hours perſeverance in the uſe of it.

When this gentle method of treatment did not anſwer in the courſe of forty-eight hours, or three days at moſt, I gave ſmall doſes of calomel, ſuch as three or four grains joined to a little jalap, or extr. catharticum, twice or thrice in the twenty-four hours, not daring, when a young practitioner, to preſcribe larger doſes for fear of weakening and thereby hurting my patients.—When the calomel was given in ſuch ſmall doſes it always affected the mouth, and although it never failed to remove the diſeaſe, even ſometimes before ſtools were procured, it was attended with great inconvenience and uneaſineſs to the ſick.—The mouth, tongue, and throat were often much ſwelled, and the ptyaliſm frequently became ſo very violent, notwithſtanding all the

the means employed to reſtrain it, that the patients not only ſuffered much pain, but were often alarmed at their ſituation.—I found all thoſe who were attacked with this diſeaſe, as eaſily and readily affected by mercury as ſcorbutic patients are.

Although in my practice, no bad conſequences ever followed a ſalivation, I found it ſo diſtreſſing to the ſick, and alſo ſo very diſagreeable to myſelf, that, after repeatedly experiencing the ſame effects from this method of treatment, I was induced, when the caſe became urgent, and there appeared to be danger, to preſcribe a full doſe of calomel at once, in hopes that it would operate ſo ſpeedily by ſtool, that the ſalivary glands, &c. would not be affected by it. Fifteen grains of calomel were made up into four pills, or into a bolus, with ſome aromatic ſpecies, and given at once; and in many caſes where the diſeaſe had continued five or ſix days without ſtools or any relief of the pain, a ſcruple of calomel was made up and given in the ſame way, which never failed to open the bowels in about five or

ſix

ſix hours, and removed the diſeaſe without bringing on a ſalivation; but the gums and mouth were generally more or leſs affected for ſeveral days after.—In ſome deſperate caſes, when called after all the uſual means had failed, and the pain and conſtipation had continued for ſeven or eight days, I have preſcribed half a dram of calomel to be made up into eight pills, which were all to be given in the courſe of four or five hours, if ſtools were not procured by the firſt ſix before the firſt period; and this bold practice was always attended with ſucceſs; which, if not attempted, the diſeaſe would have certainly proved fatal.

Nouriſhing ſoup, caudles, and mulled wine with ſpices, were neceſſary to ſupport the ſick, after the alvine diſcharge commenced, and if they became weak and faintiſh, an anodyne draught was ordered to reſtrain the immoderate purging and violent teneſmus.—Emollient clyſters were thrown up daily, ſometimes with laudanum if the teneſmus continued, and a lubricating diet, ſuch as ſago, or arrow-root—Starch jelly

jelly with wine was ordered for ſeveral days after. When the ſtrength was reſtored, a table ſpoonful of caſtor-oil was given occaſionally, if the patient was threatened with coſtiveneſs.—The bark, which is ſo often preſcribed in ſome form or other, to thoſe recovering from other diſeaſes in tropical climates, as a tonic, and with ſuch good effect in reſtoring the appetite and ſtrength, has been found hurtful after this diſeaſe, by bringing on relapſes, or at leaſt I thought they were often occaſioned by it, and have therefore laid aſide the uſe of it.

Palſy ſucceeds a very ſevere and long continued attack of this diſeaſe, or proceeds from frequent relapſes of it. To prevent which, the cure ſhould be attempted by calomel as ſpeedily as poſſible, and relapſes avoided by keeping the bowels open afterwards.

Small doſes of cathartic ſalts, two or three cathartic extract pills occaſionally, or caſtor-oil as mentioned before, anſwer this laſt purpoſe beſt.

Our

Our Souffriere waters, which are aluminous and contain much hepatic gas, have had a good effect in preventing relapſes and curing the palſy proceeding from lead. I have given thirty or forty drops of balſam. peruv. on ſugar, to thoſe recovering, once or twice a day with ſeeming advantage.

There can be no doubt that this is the ſame diſeaſe as the colica pictonum, or Devonſhire colic, proceeding from a ſolution of lead, or from the fumes of it, by living in painted houſes; as it has been obſerved, that all houſe-painters have the diſeaſe more or leſs in the Weſt Indies. It has not prevailed ſo much of late years as it did fifteen or twenty years ago, owing probably to the great attention that has been paid to curing the rum before uſing it; and perhaps alſo to the ſtill necks and worms being generally now made with a mixture of tin, inſtead of lead as formerly, by the hardneſs of which, a ſolution of lead in the high proof hot ſpirit, when paſſing through theſe, is prevented; or if any particles are taken up, they ſubſide on the evaporation of the fiery

or volatile parts that ſuſpended them, in the operation of ſhifting, or curing rum, as it is called *. In confirmation of this it has always been remarked, that the drinkers of new rum only are afflicted with this diſeaſe, or thoſe who live in newly painted houſes, or ſuch as are employed in painting with white lead, as was obſerved before.

* The new rum runs from the ſtill into five gallon cans, which is thrown into butts, from thence it is drawn off into tubs and put into puncheons, and ſhifted from puncheon to puncheon every month or oftner, if wanted ſoon for uſe, by which its empyreumatic taſte and ſmell, called haut-gout, is removed; this is what is called curing. It is ſhifted only once every four or ſix months when not wanted very ſoon. Various methods have been tried for the ſpeedy curing of rum, or giving it that perfection which it attains by age and ſhifting, ſuch as the addition of burnt ſugar or rice, and green tea; but within theſe few years paſt, it has been diſcovered that nothing is ſo efficacious in bringing it to an early maturity, as a few handfuls of powdered charcoal thrown into each puncheon every time it is ſhifted, which both improves the colour, and removes the haut-gout.

CHAP-

CHAPTER VI.

Of the Cholera Morbus.

THIS diſeaſe begins with a vomiting of thick yellow bile, and a violent diſcharge of the ſame fluid by ſtool ſoon follows.

The vomiting and purging increaſe every moment in violence, and the ſick are frequently quite exhauſted, their pulſe ſunk, and their extremities cold, before any medical aſſiſtance is called in. This often happens in the courſe of a few hours from the firſt attack.

In ſuch caſes, no time is to be loſt in adminiſtering opium, and as it will ſeldom remain on the ſtomach in a liquid form, and takes a conſiderable time to diſſolve when given in pills, it becomes neceſſary to throw up fifty or ſixty drops of laudanum in a clyſter immediately, and to give a grain of ſolid opium

at

at the ſame time, which muſt be repeated every hour till the vomiting ceaſes. When the caſe is not ſo very urgent, an epithem of mint ſtewed in wine, and applied warm over the pit of the ſtomach, giving at the ſame time two grains of opium in a pill, generally puts a ſtop to the diſeaſe in an hour or two. Although this is by no means a dangerous diſeaſe, when attended to in time, yet as inſtances have occurred of its proving very quickly fatal when neglected, the ſpeedy adminiſtration of opium ought never to be omitted. It always proceeds from a redundant, and ſometimes vitiated ſecretion of bile. It generally happens alſo in very hot weather; and eating large quantities of fruits and vegetables, is often the immediate cauſe of it. If a yellowneſs of the eyes and ſkin appears after, which is ſometimes the caſe, a few grains of calomel ought to be given for two or three days, when the ſtrength is reſtored, and a doſe of Epſom ſalts or caſtor-oil afterwards. Directions ſhould be given to the ſick, to avoid eating vegetables or fruits for ſome time after.

A vomiting

A vomiting and purging frequently comes on, from eating a quantity of vegetables, unripe fruits, or any thing elſe that has diſagreed with the ſtomach, but as little or no bile is diſcharged, and this diſorder ſeldom becomes dangerous, it is called an Indigeſtion, and is cured by drinking plentifully of camomile-tea or warm water. An anodyne draught is ſometimes neceſſary to allay the irritability of the ſtomach, and ſmall doſes of magneſia and rhubarb were generally preſcribed afterwards to reſtore its tone, and to correct acidity, which always accompanies this diſeaſe.

CHAP-

CHAPTER VII.

Of the Tetanus, or Locked Jaw.

In my opinion this dreadful diſeaſe ought to be divided into two ſpecies, the Idiopathic and Symptomatic, as the former often admits of a cure, whereas the latter, proceeding from a læſion of nerves or tendons, has, from my own experience, and that of all my medical acquaintance in the Weſt Indies, reſiſted every remedy hitherto tried, having always proved fatal.

Section I.

Hiſtory of the Diſeaſe.

The idiopathic tetanus proceeds from ſleeping on the cold ground in the night in damp places, or from getting ſuddenly wet after having been much heated, or from remaining long in wet clothes, and lying out in the cold dew. But as it happens moſt fre-

quently to negroes, the cauſe can very ſeldom be diſcovered.

The ſymptomatic comes on after pricks of nails or fiſh-bones in the feet, or from ſplinters of hard wood running into the feet or hands, or from cuts of glaſs bottles in the ſoles of the feet or about the toes. Alſo after pricks of ſwords, and after gun-ſhot wounds in the extremities, eſpecially about the feet and ankles, after compound fractures with ſplintered bones, and after amputations of arms, legs, fingers, or toes. In both ſpecies there is a remarkable coldneſs in the hands and feet, and alſo cold ſweats, but more eſpecially in this laſt. This diſeaſe does not always, however, follow ſuch punctures or læſions from accidents, or come on after operations.

I have never met with the emprofthotonos in either of the ſpecies. It always began with a ſtiffneſs of the muſcles of the neck and the lower jaw. The jaws cannot be opened more than a quarter of an inch aſunder. The head is frequently drawn back,

back, and at the ſame time the jaws are ſhut cloſe. Theſe ſpaſms return more frequently, and with greater violence, as the diſeaſe advances, till in forty-eight or ſeventy-two hours, if it continues ſo long, the teeth are ſo cloſely ſhut that nothing can be got into the mouth; the ſpaſms become almoſt inceſſant, every muſcle of the body is in violent action, till at laſt a general convulſion, in the ſymptomatic kind, puts a period to life *. I knew two inſtances of this diſeaſe being brought on by ſmall fiſh-bones ſticking in the throat for ſome time, and a negro who had it after being ſtung in the glans penis when aſleep, by a large waſp called jackſpaniard, in the Weſt Indies. They were all attacked on the eighth or ninth day after and died.

As the triſmus infantium or jaw-fall, as it is called, never happens to infants after

* Although the ſick had great difficulty in ſwallowing during the ſpaſms, they appeared to have no averſion to water, or any other fluid, as is the caſe in the hydrophobia; nor did they ſlaver, or ſhow any ſymptoms of furious delirium.

the ninth day of their age, it may be conſidered as a third ſpecies of this diſeaſe.

SECTION II.

Of the Cure.

THE idiopathic tetanus was ſometimes cured by warm frictions, wine, opiates, and bark. But I have ſucceeded beſt by mercurial frictions, uſed every two hours all over the neck and ſpine in very large quantities, as mentioned in a former part of this work, until the mouth was affected by it. The mercurial ointment was ſeldom weighed, or the laudanum dropped in this diſeaſe. Calomel was mixed with ſyrup, and given with the laudanum when the patient could ſwallow it. Wine was always given in large quantities, and alſo nouriſhing clyſters. This method has often ſucceeded in removing this direful diſeaſe. The cold-bath never anſwered with me, although I have frequently tried it. I have often wiſhed to try electricity, but never had an apparatus in

perfect

perfect order till lately, ſince which no caſes have occurred.

In the ſymptomatic kind, the punctures or cuts are generally healed, and after operations the ſtump looks well, before the diſeaſe comes on, which (when it takes place) is always on the eighth, ninth, thirteenth, or fourteenth day after the accident, or operation, as I have never known it to come on after the fifteenth.

As tetanus attacks more frequently at the firſt period mentioned above, than at the ſecond; when the firſt paſſed over I had hopes of recovery, but after the fifteenth day I never heſitated to pronounce the patient out of danger from this diſeaſe. When it unfortunately came on, I employed all the means before deſcribed for the recovery of the idiopathic kind, beſides opening and ſcarifying the parts that had been punctured or cut, and ſometimes deſtroying the nerve above the place, dreſſing the parts with mercurial ointment, and the ſtump with the ſame after operations,

pouring laudanum over the lint, and giving it by tea-ſpoonfuls to drink, puſhing the mercurial frictions to the utmoſt extent, and giving plenty of wine; but all to no purpoſe. The extremities were often rubbed with muſtard, Cayenne pepper, and ginger, ſteeped in rum, &c.

As I found, from ſad experience, that I could never cure this very dreadful diſeaſe, I thought of trying ſome method of preventing it. It occurred to me, that, probably owing to its very rapid progreſs, there was not time to throw a ſufficient quantity of mercury into the ſyſtem, to cure or overcome the great irritability or tendency to violent ſpaſmodic contractions in the muſcular fibres. And as mercury ſeems to act as a powerful antiſpaſmodic in ſome other diſeaſes, I was diſpoſed to give it a fair trial after accidents and operations, to prevent tetanus, knowing of no other remedy ſo likely to produce that happy effect.

After wounds or punctures I therefore gave two or three grains of calomel twice a-day, and dreſſed

dreſſed the part with mercurial ointment, from the day theſe accidents happened till a gentle ſalivation came on. And after operations I gave three grains of calomel every night with a grain and a half of opium, and three or four doſes of bark in the day-time, without regard to the ſymptomatic fever, till the mercury affected the mouth, which was generally the ſeventh or eighth day, when I gave the calomel every ſecond night only, and continued the opiate and bark till after the fifteenth day, when all was laid aſide but anodynes. When the mercury did not begin to affect the mouth the ſeventh day, I ordered ſome mercurial ointment to be applied over a part of the ſtump, which ſeldom failed to bring it on. Out of fifteen patients, after amputations, that were treated in this way, only one died, and he was in ſuch an irritable ſtate before the operation, that I dreaded the conſequence, and was averſe to its being performed. He was ſeized with ſymptoms of the tetanus the eighth day, and died the ninth at night.

I do not pretend to aſſert, that the reco-

very of ſo many patients after operations, in the Weſt Indies, was entirely owing to this method that I have employed for the prevention of the tetanus. In ſuch trials nothing can be proved with certainty. The proportion of men who recovered by this method after operations, is much greater, however, than is cuſtomary in the Weſt Indies, viz. nearly three to one more than by the common method of treatment, as far as I have had opportunities of obſerving. Its ſucceſs will, therefore, I hope, recommend it to the attention and trial of the medical gentlemen of the navy and army in the Weſt Indies. It cannot prove hurtful, and from comparing caſes in my private practice, I am convinced of its utility. I have ſucceeded in a double proportion by this treatment, with thoſe who had been wounded or punctured, having only loſt two out of a great number ſince I began it.

For many years after my arrival in the Weſt Indies, nearly one-fourth of the negro children on the plantations, died of the triſmus, or jaw-fall, on the eighth or ninth

day

day after they were born. It therefore became a matter of ſerious conſideration with the planters, to find out a method to prevent this mortality among their negro children. That the diſeaſe could not be cured was ſoon diſcovered, as not a ſingle inſtance of ſuch an event ever occurred. The cauſe was ſuppoſed to be meconium in the bowels, or thought to proceed from the bad inſtruments that the negro midwives uſed in cutting the navel-ſtring. The infants were purged with caſtor-oil or magneſia, to remove the meconium as ſoon as poſſible; the midwives were furniſhed with ſharp ſciſſars or razors, and ſhewn the proper method of cutting and tying the navel-ſtring. But all this did not anſwer my expectations. I obſerved that the children born in large negro-huts generally recovered; and that white children, or thoſe of free people, who had their kitchens apart from their dwelling-houſes, eſcaped the jaw-fall; I therefore ſuſpected that the ſmoke from burning wood, was the cauſe of it. In conſequence of this I gave orders that no fires ſhould be allowed in the negro-houſes where the lying-in women were; which anſwered the purpoſe of preventing

preventing the diſeaſe, when the order was complied with; but negroes are ſo fond of fire that they often lighted it up by ſtealth, and thereby fruſtrated my plan. I then recommended a lying-in-hoſpital to be built on every eſtate, near the negro-houſes, with a planked floor, ſo that no fire could be kept in it; ſince which no children, who were born in theſe hoſpitals, and remained with their mothers in them for nine days, have ever been attacked with this diſeaſe. I wiſh to recommend ſuch hoſpitals on every plantation in all the iſlands. The negro women, however, often elude the hoſpital, by concealing their pains till they cannot be moved from their own houſes; this proceeds from a love of home, or from jealouſy of their huſbands; but by perſeverance, and carrying them to the hoſpital after they are delivered, all this may be overcome.

It is remarkable, that infants are never attacked with it after the ninth day of their age, as was obſerved before.

The fires in the Weſt Indies are made of wood, and the ſmoke from them is ſo ſtimulating

lating to the eyes, that few white people can bear it for a moment. From the foregoing obſervations I am of opinion, that the ſmoke of wood uſed as fuel in ſmall huts where it has not a proper vent, is the cauſe of this diſeaſe among infants in ſome parts of Switzerland and France, and in the Highlands of Scotland, as well as it is in the Weſt Indies.

THE CHEMICAL ANALYSIS AND MEDICAL PROPERTIES OF THE HOT MINERAL WATERS IN THE ISLAND OF *DOMINICA*;

WITH SOME OBSERVATIONS ON VOLCANOS IN THE WINDWARD AND LEEWARD WEST INDIA ISLANDS.

THE Souffriere Waters, proceeding from a volcano on the ſouth end of this iſland, have been uſed for various diſorders with good effects for many years paſt; but from the beſt information I have been able to collect, no chemical analyſis of them had ever been attempted. I had been there on viſits to ſick people frequently, but had not time to examine theſe waters in a chemical way; I therefore made, at this time, two excurſions for this expreſs purpoſe.

Theſe

Theſe mineral waters are hot, iſſuing from the ſide of a very ſteep ridge of mountains about two miles from the ſea, forming a ſmall rivulet which runs into it. Near to the ſea-ſide ſome of the ſubterraneous hot waters find an outlet, and keep conſtantly bubbling up. This hot ſulphureous water, and the water of the rivulet now become cold, may be felt at the ſame time. There are three craters, the uppermoſt of which is the largeſt; there the waters boil up moſt violently, making a rumbling noiſe like diſtant thunder, ſmoking much, eſpecially in rainy weather. In all the volcanos the water is quite black, when it iſſues forth from the ſubterraneous boilers, but ſoon after it turns of a pale cream colour, leaving a whitiſh ſlimy cruſt upon the ſtones below its ſurface. The parts of the ſtones above the ſurface of this water, are covered with a browniſh or dark yellow cruſt, reſembling ocre. The bottom and ſides of the channel of the rivulet, are covered with a white earth or clay, and ſmall porous white ſtones. On each ſide of the channel, a number of ſmall openings, like chimnies to furnaces,

were

were obſerved, from which hot black vapours are conſtantly iſſuing. It is dangerous to approach a place where a number of theſe ſmoking openings are collected, as the ground is hollow below, and the heat of the ſteam is equal to that of boiling water. On the banks of the lower rivulet, great quantities of cryſtallized ſulphur are found, and a quantity of alum, ſometimes pretty pure, and at other times mixed with clay or earth; it has, however, more the appearance of burnt than common alum.

The water has a ſtrong aſtringent taſte, and a ſulphureous ſmell, when taken near the ſource, but it loſes the ſmell after running for two or three hundred yards, when it becomes cooler, turns white, and much clearer. At the ſource of the lower Souffriere, the water as it iſſues from one of the craters (for there are great numbers) raiſed Fahrenheit's thermometer in one minute to 205 degrees. There we found a large boiler filled with black coloured round bullets, from the ſize of ſwan-ſhot to that of piſtol-

balls, floating in the water, and in perpetual motion from its ebullition. Theſe, when lighted with a candle, burned away with a beautiful purple flame, and emitted ſtrong ſulphureous vapours, which tinged ſilver black in a few ſeconds. Pure ſulphur was formed round the forceps that held theſe balls during their combuſtion; the ſmall portion of matter that remained ſeemed to be earth or clay. Boiling water did not diſſolve theſe balls thoroughly, but the water was impregnated with all the ſenſible qualities of the Souffriere waters brought from the ſpot. About 100 yards below this crater the thermometer, placed in the ſtream of the rivulet, roſe to 130 degrees: five gallons of water were taken from this place to be analyſed. Where the baths now are, is about 300 yards below the firſt ſource of the water. The thermometer put into the water at this place roſe to 106 degrees, which upon ſeveral trials was found to be the medium heat there. The ſource of the ſecond Souffriere is about a quarter of a mile from the firſt, and the third Souffriere is ſtill higher up, on the ſide of the ſame ſteep mountain. The ſecond is about 200, and the third 300 yards

yards above the level of the ſea. A ſtrong ſolution of the vegetable alcali precipitated a white powder from theſe, and a large quantity of ceruſſa was alſo thrown down by a tea-ſpoonful of acetated lead, which we had found to be exactly the caſe with the water of the loweſt Souffriere. From appearances, and the taſte of theſe upper waters, we ſuppoſed they contained more iron than the loweſt; but upon trial with aſtringents, &c. we did not find that to be the caſe. The ſtreams of theſe two boiling outlets take a different courſe from the loweſt, but they all unite before they reach the ſea.

The land is very rugged and ſtony, and the heat in the day-time here in dry weather is almoſt inſupportable. In our ſecond excurſion, when walking in the ſun about two o'clock, P. M. near the middle Souffriere, Fahrenheit's thermometer roſe to 120 degrees, and when put upon a ſtone expoſed to the rays of the ſun, while we reſted ourſelves under the ſhade of a tree, it ſoon roſe to 138 degrees, which will appear almoſt

almoſt incredible, but is a fact; and what is perhaps equally ſurpriſing, that although expoſed to this extraordinary heat for ſeveral hours, we ſuffered no bad conſequences from it *.

The vapours from theſe volcanos are quite black and very offenſive, and occaſion violent head-ach and faintneſs to people expoſed to them for ſome time, but they do not appear to hurt vegetation. The upper crater makes a greater noiſe than the others, and throws out the ſteam with greater violence, but I did not obſerve any ſtones or lava thrown up when I was there; however, I am not certain but this may be the caſe at times, from the appearance of the lava at ſome diſtance from the crater. There appears formerly to have been a great number of Souffrieres in this quarter of the iſland, which are now extinguiſhed; but along the ſea-ſide hot water is found

* Mr. William Bremner, a medical gentleman of this iſland, accompanied me on this occaſion, and aſſiſted me in analyſing the waters.

bubbling from under the rocks in many places, which have the ſame ſenſible qualities as theſe I have deſcribed.

Chemical Analyſis of the Souffriere Waters.

1ſt. *The Effects of Re-agents.*

Experiment 1. The vitriolic acid had no ſenſible effect whatever upon them.

Exp. 2. Neither had the muriatic.

Exp. 3. A ſilver coin immerſed in the water was not tarniſhed.

Exp. 4. The tincture of gall-nuts in ſtrong proof ſpirit had little effect upon the water, after having been expoſed to the air for ſeveral days. But when it was heated, the tincture tinged it of a dark green colour, which by ſtanding for ſome time became moderately black. When a few drops of the tincture was added to a ſtrong ſolution of the balls formerly mentioned, in boiling water, a very black ink was formed in a ſhort time.

A ſmall quantity of the aqueous infuſion

ſion of the rind of the pomegranate fruit, added to the ſolution of the balls as above, produced a very dark ink fit for writing in the ſpace of two hours. A ſhining purple-coloured ſcum was formed on the ſurface of this ſolution, after the addition of the aſtringent infuſion.

Exp. 5. With the Pruſſian alcali. A few drops of this turned a glaſs of the water of a beautiful purple colour; and by adding ſome more, a large ſediment fell to the bottom of the glaſs, which was evidently Pruſſian blue.

Exp. 6. The fixed vegetable alcali threw down a fine whitiſh coloured powder, without efferveſcence

Exp. 7. Lime water produced the ſame effect as the former.

Exp. 8. The cauſtic alcali occaſioned a thick greeniſh cloud in the waters, which remained ſuſpended in the glaſs for a long time, and after ſubſiding to the bottom turned of a very dark green colour.

Exp. 9. The volatile alcali efferveſced a little in the water, and occaſioned a green cloud in it as in the former experiment;

but after ſubſiding it did not turn ſo dark, nor was the ſediment ſo great. After ſtanding for ſome time a thick ſcum formed on the top, which was evidently iron, and the clear fluid below had a very ſtrong chalybeate taſte.

Exp. 10. By a few drops of acetated lead, a white powder was precipitated from a wine glaſsful of the water, which had a ſweetiſh taſte, but ſeemed to be twice the quantity of ceruſſa that could have been ſuſpended by the vinegar.

Exp. 11. Muriated barytes turned the water white, and precipitated a white heavy powder. It did the ſame when added to hard water, although not in ſuch a quantity; when added to pure rain water there was no ſediment.

Exp. 12. Lacmus turned a wine glaſsfull of the water of a light red colour—hard water was alſo turned a little red by it—but pure rain water, by adding a little of it, was turned to a beautiful blue colour.

Exp. 13 Nitrated mercury precipitated a large quantity of a beautiful orange coloured powder—when the nitrous acid was afterwards

afterwards obtained very pure, the quantity of this precipitate was not ſo conſiderable.

Exp. 14. This precipitate turned brown when lime water was poured upon it.

Exp. 15. This laſt powder diſſolved entirely in the muriatic acid.

Exp. 16. Acid of Sugar. This made no change whatever upon the water, when added to it in ſmall or very large quantities. —after ſtanding for ſome time, the water turned rather whiter than it was before, but ſo little that it is not to be relied upon.

It is worthy of obſervation, perhaps, that a ſolution of the ſulphureous balls formerly mentioned, in pure hot water, exhibited preciſely the ſame chemical phenomena, with the re-agents that the natural Souffriere waters do.

Diſtillation and Evaporation of the Souffriere Waters.

Exp. 17. About two gallons of the water were put into a retort with a receiver not

luted; while the diſtillation was going on, black offenſive vapours came over, which tinged a ſilver coin quite black, in the ſame manner that the ſteam at the ſource of the Souffriere waters did. The diſtilled water in the receiver was quite pure.—I had not a proper pneumato-chemical apparatus to collect and examine this gas by, but this is perhaps of leſs conſequence, as it clearly appears to have been hepatic or ſulphureo-hydrogenous gas.

Exp. 18. When the water in the retort turned muddy, a Florence flaſk was filled with it, and being evaporated to dryneſs, there remained a fine white taſteleſs powder. Some of this powder was waſhed in high proof ſpirit and dried again. Neither this powder, nor the reſidue produced by the other re-agents, were inflammable.

Exp. 19. A part of this powder was mixed with water in a wine glaſs, and vitriolic acid poured upon it, which, after ſtanding a day, began to cryſtallize on the ſides of the glaſs, and formed a neutral ſalt, which was evidently alum.

Obſer-

Obſervations.

From experiments, N° 1, 2, 3, it appears that there is no real hepar ſulphuris in theſe mineral waters; but from exp. 17, it is plain and evident that they abound with hepatic gas, or, according to Monſ. de Fourcroy, being only impregnated with that gas, they may be termed hepatized thermal waters.

Exp. 4. And more particularly exp. 5. ſhew that they contain iron ſuſpended probably by the vitriolic acid, as appears from expts. 11 and 12. Heat ſeems alſo to have ſome power in keeping the iron diſſolved, as great quantities of ocre were depoſited on the ſtones in the rivulet, when the water became perfectly cold. They ſeemed then to poſſeſs only a weak impregnation of that metal.

Exp. 6, 7, 8, 9, 10, prove that an earth is ſuſpended by an acid, and the ſynthetic exp. 19 proves that acid to be the vitriolic, and that earth to be clay, of which there

is more than ſufficient to ſaturate the acid. The yellow precipitate produced by the nitrated mercury, is not ſo eaſily accounted for.—The hot waters at Bath produce the ſame phenomenon with this ſolution of mercury, according to Dr. Charleton's analyſis; but it does not appear to proceed from an alcaline principle in our Souffriere waters, as he aſſerts it does in the waters at Bath, as is clearly proved from exp. 16. the acid of ſugar being the beſt teſt for diſcovering calcareous earth, or any other alcaline earth.

It appears from exp. 15. that this precipitate was Turpeth mineral, as it diſſolved entirely in the muriatic acid, from which, probably, corroſive ſublimate might have been obtained, if there had been a ſufficient quantity collected to have tried the experiment. Theſe waters are ſtrongly impregnated with alum, with exceſs of a fine white clay, pure hepatic gas, and vitriolated iron; from which they may be termed thermal, aluminous, hepatized waters, with a portion of iron ſuſpended in them.

All

All round the volcano this hepatic gas is poured forth from innumerable openings, like ſmall chimnies, on the edges or ſides of which pure flowers of ſulphur are formed. This is a beautiful phenomenon, which probably ariſes from the vital air of the atmoſphere decompoſing this hepatic gas, and thereby depoſiting its ſulphureous part—drops of pure water were found hanging from theſe openings.

Medical properties of the Souffriere waters.

BATHS and accommodations for ſick people were built many years ago; which having been neglected for ſome time paſt, are now almoſt decayed. The water at the baths, as I obſerved before, roſe Fahrenheit's thermometer to 106 degrees, but there is a bath where the water is received and allowed to cool to that degree of heat which is directed by the phyſician. The water is generally drank at about natural heat or 98°, but ſometimes it is uſed when quite cold. The general effects of it are to promote perſpiration when drank warm, and when cold it

appears

appears to act as a tonic. The itch, ſcorbutic, and herpetic eruptions, and all cutaneous diſeaſes are relieved, and moſt commonly removed entirely, by bathing twice a day for ſome time in the water, allowed to cool to the degree of natural heat. Rheumatic diſorders of the chronic kind were greatly relieved, and ſometimes cured by bathing. Anchyloſis, rigid tendons, and ſtiffneſs of the ſmall joints, when they did not proceed from a ſiphylitic cauſe, were cured by the douche, bathing, and drinking the waters. They have been employed very frequently in paralytic diſorders, and in thoſe proceeding from the dry belly-ach, which is occaſioned by lead, as was obſerved before, they were very efficacious, ſeldom failing to effect a perfect cure.

In complaints of the ſtomach and bowels proceeding from the fumes of lead, in giddineſs of the head, trembling of the limbs, tingling at the ends of the fingers, and other nervous affections, ſo common among houſe-painters, or among other people, occaſioned by their living in newly painted houſes, or drinking much new rum; the Souffriere

waters drank lukewarm, three or four times a-day, and bathing in them once or twice a-day, contributed very much to alleviate, and ſometimes removed them entirely. A good diet and exerciſe were uſed at the ſame time; but to reſtore the ſtrength, and thereby complete the cure, the cold ſea-bath was generally neceſſary. In the hemiplegia, or leſs violent paralytic affections, proceeding from an apoplectic attack, they were not found to be ſo beneficial, although drank cold, and the bath uſed nearly cold. In one inſtance they proved evidently hurtful, but the bath was uſed hot, and the bad effects proceeded, probably, from that circumſtance. In general, they may be employed for the ſame complaints for which the Bath waters are ordered, and with equal advantage.

General Obſervations.

NEAR the middle of this Iſland on the top of a high mountain, there is a much larger volcano ſtill burning, than that now deſcribed. It forms a hollow reſembling a punch bowl, and occupies a ſpace of ground equal

equal to 12 or 15 acres. A ſmall river of hot Souffriere water iſſues from this volcano, having the ſame ſenſible qualities as thoſe which have been analyſed. I have ſeen and taſted the water near the ſea-ſide, but the deſcription of the place is from the information of people who have been on the ſpot, as a journey to a part of the Iſland ſo difficult of acceſs was too fatiguing for me to undertake. In all our Windward and Leeward Iſlands, there have been ſimilar volcanos, moſt of which are now burnt out; but their remains are eaſily diſcovered by the hot water that is poured forth at ſome diſtance from them, and by exploring the mountains, as Morne Agrou was in Saint Vincent, by Mr. Anderſon, who has given a very accurate and ingenious deſcription of a large volcanic crater in that mountain, in the Philoſophical Tranſactions. There are hot waters in the Iſlands of Saint Chriſtopher' and Nevis, but the volcanos there have been extinguiſhed long ago. Evident marks of different craters are to be ſeen in the mountains there, and alſo in the Iſland of St. Euſtatius. Many ſmall Souffrieres are burnt out in this Iſland, and alſo

in

in Martinico and Guadaloupe. There are ſeveral volcanos ſtill burning in theſe Iſlands, the waters of which reſemble ours in every reſpect, and are employed for the cure of the ſame diſeaſes.

In the Iſland of Guadaloupe particularly, there is a very large volcano, which throws out great quantities of lava, and can be ſeen ſmoking at a great diſtance.

The difference in the qualities of the hot waters of theſe Iſlands, ariſes from the ſtrata of earth and minerals that they paſs over. In ſome there is probably a bed of clay, or calcareous or magneſian earth and iron ore. In our Iſland it paſſes through argillaceous earth, and this ſeems to be the caſe in all the Iſlands that I have viſited, for they all abound with clay, and a variety of pottery is made in every one of them. All have pyrites, black ſand, that is attracted by the magnet, or iron ore in ſome form or other. Sulphur is alſo always found near and in the burning volcanos, and all pour forth the ſame hepatic gas. Large quantities of ſul-

phur

phur are found in banks all round the craters, after the ſubterraneous fires are extinguiſhed. It appears very evidently, that volcanos have been burning in all the Windward and Leeward Weſt India Iſlands, at ſome period of time; and that in thoſe ſituated loweſt, the fire has burnt out firſt, and continued to burn longeſt in the higheſt or moſt mountainous. In the low Iſlands of Barbadoes, Antigua, Nevis, and Marigalante, they have been extinguiſhed long ago, but continue to burn in many places in Martinico, Guadaloupe, and in this Iſland, which is the moſt broken and the moſt elevated of them all.

Volcanic ſtones are found on the ridges or tops of mountains in all theſe Iſlands, either in a vitrified ſtate, or in lava of a white or gray colour, being very light and porous, having black and ſhining ſpots interſperſed in them, which being cut or dug out, appeared to be bits of ſchorl. Some of theſe ſtones are of a more compact texture, and being capable of reſiſting the greateſt heat

heat without cracking or flying, are called fire-ſtones, and are uſed for hanging or building coppers and ſtills for boiling of ſugar and diſtilling of rum. The tufa or lava found near the openings of old volcanos, is very light and ſpungy, generally of a pale white or reddiſh colour, and in places where it has been long expoſed to the air, it is mouldered into a ſort of ſoft gravel. Coral rocks are found at a great height above the ſurface of the ſea, all round the ſea coaſt of theſe Iſlands, ſometimes in ſtrata covered with earth, but more frequently in large maſſes; from which, by burning, lime is made. Coral rocks are always formed at the bottom of the ſea, by the petrifaction, or incruſtation of coral, ſea-weeds, and other ſubmarine plants.

Earthquakes have not been ſo frequent nor ſo violent for theſe twenty years paſt, as they were formerly, according to the accounts given of them by the oldeſt inhabitants.

How

How theſe ſubterraneous fires are generated in the bowels of the earth, is a queſtion of very difficult ſolution; the diſcuſſion of which I ſhall not preſume to enter upon at preſent, although I may make ſome attempt of that kind, when I am more at leiſure.

F I N I S.

E R R A T A.

In page 18, dele "violent."
D° 115, *for* "which" *inſert* "and."
D° 118, *inſtead of* "the" *inſert* "its."

APPENDIX.

EXPERIMENTS ON THE *CINCHONA BRACHYCARPA.*

By Mr. BRANDE,
APOTHECARY TO THE QUEEN.

1ſt. WATER and ſpirit diſtilled from it, became ſlightly impregnated with a peculiar aromatic flavor, not diſcoverable in any other preparation.

2d. The decoction ʒij to ℥vj of water boiled to ℥iv is of a deep color, clear, and poſſeſſes the whole flavor of the bark; on cooling it becomes turbid, and depoſits a powdery ſediment, but leſs in quantity than the common Peruvian, the yellow, or angaſtura bark, which, as in theſe, is again nearly ſoluble by the addition of the vegetable or mineral acids, &c. *

3d. The infuſion ʒij to ℥iv of boiling

* I had not obſerved the importance attached by Dr. Relph, to the property poſſeſſed by the decoction of the yellow bark, of remaining ſound a much longer time than either that of the common or red bark, till within a few days of the above being ſent to the preſs, therefore had not time to compare the cinchona brachyocarpa, with it in this reſpect. *Vide his Inquiry, &c. p.* 133.

water, appeared equally ſtrong as the decoction, and remained clear.

4th. On ʒij were poured ʒ iv of cold water, and frequently ſhaken during twelve hours, then ſtrained; this infuſion appeared nearly of equal ſtrength with the above; three freſh portions of water were then poured upon the bark, and being ſtrained were mixed together. Two ounces of rectified ſpirit were added to the reſiduum, which, after digeſting eighteen hours, had extracted very little taſte or color.

5th. The tincture one ounce to four of rectified ſpirit (which was afterwards uſed for the reſinous extract) was deep colored, but with little taſte.

6th. Proof ſpirit is a good menſtruum; but ſpirit diluted with three or four parts of water is the beſt.

7th. Solutions of pure, and carbonate of potaſh, extracted deep tinctures, but leſs ſo than thoſe of ammonia.

8th. Dilute ſulphuric acid extracted a very ſlight taſte and color.

9th. Diſtilled vinegar diſſolved but little.

10th. Sp. ætheris vitriol extracted very little.

11th.

11th. Sp. ætheris nitros. is a ſomewhat better; by no means a good menſtruum.

12th. Lime-water made an infuſion of a very deep color, but without much taſte.

13th. One drachm rubbed with 30 grains of lime, yielded ammonia ſcarcely ſufficient to be ſmelt, but enough very ſenſibly to whiten the fumes of muriatic acid; on this mixture were poured two ounces of cold water; the infuſion, after ſtanding 24 hours, was of a deep red color, without much flavor.

14th. One drachm was rubbed with an equal quantity of pure magneſia; the ſame was done with carbonate of magneſia; and four ounces of boiling water gradually added to each: having ſtood 12 hours, the former appeared ſomewhat ſtronger, the latter perhaps weaker than a common infuſion; the former gave the darkeſt precipitate with ſolution of iron, but not more ſo than the common decoction.

15th. Compared with equal quantities of infuſions of the common, the yellow bark, and galls, it appeared to contain evidently more aſtringent matter than the two former; leſs than the latter.

16th. The cold infuſion, No. 4. yielded

on evaporation 53 grains of a clear, bitter, dry extract.

17th. Two ounces gave, by pouring boiling water over them in a flannel bag, as long as it received either taſte, or color, and gentle evaporation, ʒ vij. gr. v. of a pilular extract.

18th. The tincture (No. 5.) yielded on evaporation 69 grains of a hard extract, nearly ſoluble by trituration in hot or cold water, the reſiduum of bark was boiled in a quart of water to three ounces, ſtrained and evaporated to the conſiſtence of honey; to which was added the reſinous part, previouſly diſſolved in a little alcohol, and the evaporation continued nearly to dryneſs, when the whole weighed four drachms five grains.

19th. One ounce diſtilled alone in an earthen retort, produced pyrolygnous acid, empyreumatic oil, and other gaſſes, the properties and quantities of which I was prevented from aſcertaining, by an accident which befel my apparatus. The reſiduum burnt in the retort to a coal weighed ʒij. gr. viij.

20th. On the 128 grains of coal in the laſt experiment, were poured eight ounces of boiling diſtilled water; after ſtanding a ſhort time

time the ſolution was filtered; to different portions of which were added ſeveral teſts, of theſe exotic acid, nitrate of ſilver, and muriate of barytis; each formed a milky precipitate.

21ſt. On the coal left behind was poured ſome dilute ſulphuric acid; this paſſed through a filter, gave pruſſiate of iron on the addition of pruſſiate of potaſh, but diſcovered nothing elſe to any teſt made uſe of.

22d. From the ſame quantity of coal obtained, as in No. 19. by the addition of diſtilled water, filtration, and evaporation, I obtained ſix grains of the following ſalts: ſulphate of potaſh, muriate of potaſh, carbonate of potaſh and lime, perhaps pure. The iron alſo in No. 21. was in very ſmall quantity.

The following Table will ſhew the quantity of ſoluble or extractive matter obtained from this and the other barks now in general uſe, for which I am indebted chiefly to Mr. Babington's Letter in Dr. Relph's Treatiſe on the Yellow Bark; ſome allowance is perhaps to be made for the different conſiſtence to which each extract may have been evaporated. I muſt alſo remark, the quantity of extract I obtain from common Peruvian bark, either aqueous or ſpirituous, is conſtantly greater than that mentioned by

Mr.

Mr. Babington, generally amounting from three to four ounces out of twelve.

From	By cold water.	By boiling water.	By rectified spirit.	By spirit and water.
Cinchona Brachycarpa was obtained.	ʒij. 53 gr.	ʒji. ʒvij. gr. v.	ʒj. ʒi. gr. ix.	ʒj. ʒiv. gr. v.
Anguſtura bark.	ʒiv. ʒvi. ʒij.	℔j. ʒvi. ʒiv. ʒij.	ʒiv. ʒiv.	℔j. ʒvij. ʒij.
Yellow Peruvian bark.	℔v. ʒxv.	℔x. ℔iv. ʒij.	ʒxij. ʒxiij.	℔j. ʒiv.
Red bark.	— —	℔x. ℔iv. ʒi.	— —	℔j. ʒij. 6/8.
Common Peruvian bark.	— —	℔x. ℔ij. ʒix.	— —	℔j. ʒij. 3/5.

It is preſumed that every pound mentioned here, is that of the Apothecary's or Troy weight.

To

To aſcertain its power of preventing and correcting putrefaction, ſeveral experiments were made with a great variety of ſubſtances, of which it will be ſufficient to obſerve, that the cinchona brachycarpa was generally found nearly equal to any as a preventive, inferior to the anguſtura as a corrective of putreſcence; it coincided very much with the yellow bark, both of which poſſeſs, in this reſpect, qualities ſomewhat ſuperior to the common Peruvian.

Having aſcertained thus much, I ſhall only inſert the following experiment:

Seven phials, each containing ʒij. of freſh ſheep gall and ʒij. of water were numbered; to the firſt was added 10 gr. of fine powdered cinchon. brachyc. to the ſecond, 10 gr. of anguſtura; to the third, the ſame of yellow bark; to the fourth, an equal quantity of freſh burnt charcoal, and three were left without any addition, as ſtandards or for future uſe.—Theſe were placed together by the ſide of a fire, where the medium of heat for 16 or 18 hours of the 24, was about 96 degrees of Fahrenheit's thermometer, and frequently ſhaken.—At the expiration of 20 hours, 1, 2, 3, 4 were quite ſweet;

5, 6, 7 ſmelt very bad; to No. 5, 10 grains of cinch. brach. were added; to No. 6, of anguſtura; to No. 7, of yellow bark, the ſame quantities.

44 Hour—all were ſweet.

56 Hours—No. 3, 4, and 6 were becoming offenſive, the reſt were ſweet.

68 Hours—No. 2 and 6 remained ſweet, the others all ſmelt very offenſive—No. 4, conſiderably the worſt, to which were added ſix grains of the ſubſtance each already contained.

24 Hours had elapſed before they were examined again, when 1 and 2 were ſweet, 3 ſmelt a little, 4 was very bad, 6 remained perfectly ſweet, 5 and 7 were again becoming putrid, but no other alteration appeared to have taken place after ſeveral hours.